

FIND THE PERFECT PILOT FIGURE

page 38

MODEL

# Airplane News

Ready-Built

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Aerobatic  
Routine

page 74

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### REVIEWED

- Giant Edge 540
- .40-size Bf109 ARF
- 1/2A Pitts kit
- Electric old-timer ARF

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# MODEL Airplane NEWS

FEBRUARY 2002 VOLUME 130, NUMBER 2

ON THE COVER: The World Models Miss America makes a low-speed pass for the camera. Reviewed by Craig Trachten on page 62, this .40-size ARF will go from box to field in little time. It's also available with a redesigned fuselage in Dago Red colors (photo by Walter Sidas).

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## Every plane needs a pilot

Whether it's sport or scale, a model airplane just doesn't seem complete without a pilot in its cockpit. Adding a pilot figure is a great way to express your personality; ever wonder why our senior editor Chris Chianelli always has a female figure in his models? *Model Airplane News* contributor Craig Trachten likes to enlist unusual pilot figures such as Buzz Lightyear and Homer Simpson; and you'll see only scale figures in senior tech editor Gerry Yarrish's planes. In our "Pilot Patrol" feature in this issue, we highlight the best sources of pilot figures, with more than 50 color photos to help you find the perfect pilot for your plane. We've even included a company that makes custom-painted pilots that look just like you or your flying buddy! From WW II fighter aces to busty blondes, you'll find it in "Pilot Patrol"; see page 38.

At the annual U.S. Scale Masters Championship, top competitors from across the nation meet for an ultimate scale showdown in craftsmanship and piloting. This year, photojournalist Jerry Nelson traveled to Hubbard, OR, to capture the action on film. See the best that scale modeling has to offer, from a giant-scale, turbine-powered F-86 to a seldom-modeled Hansa-Brandenburg C-1. Who's the best in the U.S.? Find out on page 30.

Ever wonder how those Scale Masters guys achieve such amazing detail on their fabric-covered planes? This month, Bob Benjamin shares his secrets to achieving an award-winning finish. Follow him as he details his Dynaflight Fly Baby with simulated rib stitching and tapes. He also provides easy-to-follow instructions for prepping and painting.

If you prefer an iron-on finish, check out Rick Bell's "Film Covering Basics." The secret to a perfect iron-on finish starts with sandpaper; it's easy to obtain great results with Rick's step-by-step instructions.

In his "Thinking Big" column this month, senior tech editor Gerry Yarrish continues his discussion of building wooden model structures, and he details the proper

installation of stringers and formers. He also shares his techniques for setting up tiller-arm and control-horn geometry and strong, slop-free pull/pull cable controls.

Looking for an unusual building project? This month's construction article features Henry Haffke's rendition of the Curtiss Wright Technical Institute Bunting I, an open-cockpit Golden Age racer. This shoulder-wing design is easy to build and fly, and it uses a .40-size engine for power. You'll want to clear off your workbench for this one!

### VISIT OUR ONLINE COMMUNITY

The expanded Air Age Publishing bulletin boards at [www.radiocontrolzone.com](http://www.radiocontrolzone.com) are chock-full of information on building and flying RC model airplanes, with discussion forums devoted to model aerodynamics, sport models, sailplanes, park and backyard flyers and indoor RC, as well as an area to buy and sell RC equipment and models. It's a great place to share modeling experiences, ask questions and find answers; come visit us there.



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### SPIRIT OF ST. LOUIS

I wish to thank everyone associated with the article "Spirit of St. Louis," which appeared in the November 2001 issue. I realize that the article was subtitled "A scale modeler's dream," but I suggest that the appeal of this article extended far wider than just to those who appreciate scale model airplanes. The

that I also hold and that I believe many fellow modelers do as well. My love of model aircraft goes hand in hand with a love of full-size aircraft, and Patterson's respectful, well-done essay on the Ryan NYP separates *Model Airplane News* from all other model magazines, with its acknowledgement of this kind of aviation history.

Page 37's lovely image of the Ryan's engine and decorated sheet metal is a wonderful picture of this incredible plane, and it clearly shows that there are people on the staff of *Model Airplane News* who appreciate all that aviation is, and has been. Please thank the editors responsible for commissioning, publishing and supporting articles such as this. [email]

DAVID STEERE

We're glad you enjoyed those incredible photos of the Spirit of St. Louis as much as we did, David. We're fortunate that our sister publication, *Flight Journal*, works with

talented photojournalists such as Dan Patterson. For more up-close and personal views of historic and contemporary aircraft, check out the *Flight Journal* website at [www.flightjournal.com](http://www.flightjournal.com).

DS

### SCALE COMBAT

I really enjoyed your article on RC combat in the December 2001 issue. I am particularly interested in the scale classes, but your combat kit manufacturer list didn't say which companies specialize in what. Can you give me a suggestion on who to talk to about scale combat? [email]

PHIL BROWNING

We're glad you enjoyed the article, Phil. To answer your question: several manufacturers listed offer kits suitable for scale classes. Start with Air-Kill Products; (916) 332-4661; [www.airkill.com](http://www.airkill.com). It offers a variety of scale kits and has a wealth of competition experience; an Air-Kill product won a 2000 scale combat national championship. Dealing with an established company when you start out is important, as you'll likely need spare parts sooner rather than later. Also, your fellow competitors are more likely to be familiar with a big-name kit,



many cockpit photographs, together with author Patterson's text, reveal a reverential attitude toward Lindbergh's achievement

# 1<sup>st</sup> Time Pilots or Seasoned Pros...



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so they'll be able to give you the benefit of their experience until you have a few combat rounds under your belt. Hope this helps you get started. When you've chosen a kit and built it, send us a photo so we can put it in "Pilot Projects."

MB

#### MORE ON ENGINE GASKETS

The article by John Tanzer (February 2001) illustrating high-temperature gaskets was very good. Recently, I needed a second gasket to install a Bisson Pitts-style muffler on a SuperTigre GS .51. I didn't have the article immediately at hand, and I didn't remember that he used filter paper for the base gasket material. So, I made mine from fiberglass, with the same high-temperature Permatex RTV silicone mentioned in the article. It worked very well. I wasn't sure the RTV would bond well with fiberglass, but it penetrated well, and when cured, it was very tough. With a choice of fiberglass weights from 0.5 to 4.0 ounce per square yard, the gasket thickness can be varied to suit the application. I think fiberglass will withstand heat better and also tougher and stronger than paper as a substrate. The RTV must be squeegeed very well, not only to fill the fiberglass, but also to avoid having excess unsupported RTV on the surface, which can make the gasket too compressible and subject to "bulging" at the edges. Thanks to Mr. Tanzer for this how-to article. [email]

FRANK S. THOMAS

#### ENGINE BREAK-IN

Dave Gierke's "Engine Break-In" article (November 2001) issue was an excellent subject, which probably has been covered by others, but not as well. There is no question that those of us who buy and use new engines in our models need to break them in the right way. [email]

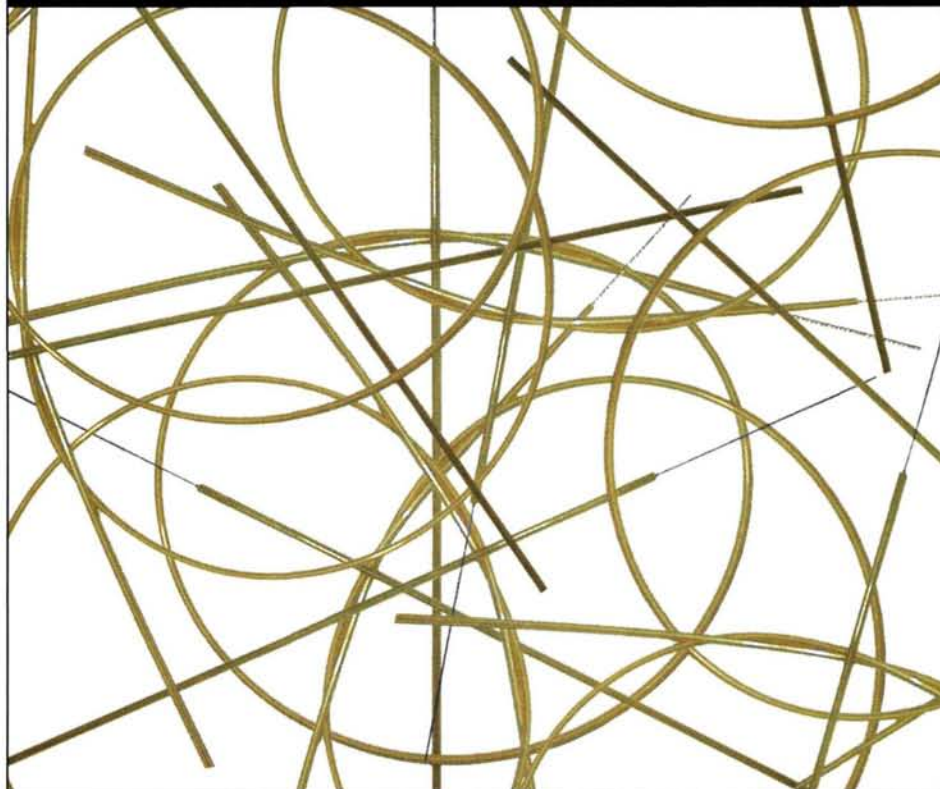
PAUL RIPLEY

I'm currently following the break-in method described in the November issue on two engines—O.S. .46 FX and O.S. .61 FX. Both engines will be mounted on their side with Pitts-style mufflers. Should they be run in this orientation with Pitts mufflers or straight up using stock mufflers? [email]

TOM DISHLEVOY

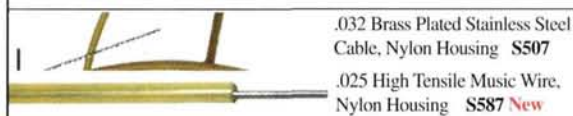
I just read Dave Gierke's "RPM" column (November issue) in which he discusses engine break-in. I found the article very informative—much more so than the literature I'm accustomed to receiving with new engines. Some manufacturers seem to gloss over the break-in process with little detail. One thing I wonder about, however, is the throttle setting during break-in. Neither Dave's article or the owner manuals of my

# For The Enlightened.



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new engines address this. How should I set the throttle on my RC engine when breaking it in? [email]

ELLIOTT HOPPER

Glad you all liked the article. To answer your questions in order: Tom, it doesn't matter in which position the engine is for break-in. Make

it easy on yourself! Elliott, the engine should be operated at wide-open throttle if its components are to attain the maximum—and complete—stress relief. Don't be worried about overworking the engine; remember, you are using a light propeller load and are not leaning the mixture to peak.

DAVE GIERKE ✦



# AIR SCOOP

by Chris Chianelli and the staff of Model Airplane News



HOBBY LOBBY INTL.

## A Wing and a Heli

Hobby Lobby definitely gets points for originality with its new 36-inch-span mini Tornado Flying Wing. Constructed entirely of EPP foam, the Mini Tornado requires no covering, and it can be assembled in as little as two hours. It launches easily, accelerates quickly and can perform more than 7 minutes of amazing aerobatics in your backyard. The plane is powered by a MIG 280 motor and gearbox that drive an oversize prop. It sells for \$69.

In response to an increase in demand for helicopters, Hobby Lobby is offering the Schweizer 300. This fully functional scale micro helicopter comes with everything you need to get it in the air except radio gear. Its design is reminiscent of the larger RC helis, and the 19.3-inch main rotor has a fixed pitch. A micro gyro is included on the tail rotor for yaw control. The Schweizer 300 is 17 inches long, weighs 11 ounces and has recorded flight times up to 7 minutes per battery charge. It's priced at \$399, but a complete package, that includes the radio gear, is available for \$509.

Hobby Lobby Intl., 5614 Franklin Pike Cir., Brentwood, TN 37027; (615) 373-1444; fax (615) 377-6948; [www.hobby-lobby.com](http://www.hobby-lobby.com).



HANGAR 9

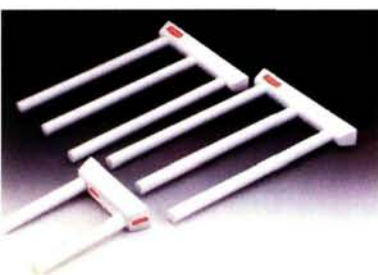
## Aspire EP RTR and Storage Racks

The new, ready-to-run version of Hangar 9's popular Aspire EP opens up the exciting world of slope soaring to a whole new generation of RC'ers. Like

the original, the Aspire EP RTR is constructed of balsa and ply, is covered in Ultracote and is powered by the same 550-type motor and folding-prop combination. The only differences between the two are in the slide-together wings and the factory-installed radio gear of the RTR version. In fact, the Aspire RTR is so complete that it even comes with a 6-cell battery pack and charger; you can be in the air in only a few hours. The Aspire EP RTR is capable of staying airborne for up to 14 minutes! It sells for \$279.99.

While you're on the phone with the folks at Hangar 9, ask them about their new storage racks that help prevent any damage to your brand-new Aspire. These racks are not only a great way to avoid damaging your planes; they're also terrific space savers. Each rack is made of solid wood and painted white. Hangar 9 even includes foam rack guards to protect your airplane's covering and soft balsa from dings and scratches. The fuselage rack costs \$5.95, and the wing rack sells for \$9.95.

Hangar 9; distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 355-9511; [www.horizonhobby.com](http://www.horizonhobby.com).



THUNDER TIGER USA

## CarryMaster

How many times have you arrived at the flying field, ready to hit the air, only to realize that you're missing that one essential tool? With the new CarryMaster from Thunder Tiger, you'll never lose anything again; and you'll be amazed by just how organized you can be. This compact, rugged case will fit just about anywhere and holds everything you need at the flightline. It's also available in a complete "turn-key" combo that includes: a four-way wrench, 3-liter fuel cell, a glow starter/charger, a 12V starting battery/charger, a 12V heavy-duty starter, a 12V fuel pump and recoil fuel tubing. It sells for \$29.99 (case alone); \$99.99 (combo).

Thunder Tiger USA; distributed by Ace Hobby Dist., 116 W. 19th St. Higginsville, MO 64037; (800) 322-7121; fax (660) 584-7766; [www.acehobby.com](http://www.acehobby.com).



GWS

## More Props

GWS certainly had slow-flyer enthusiasts in mind when it designed this selection of plastic props specifically for indoor electric aircraft. With 14 props in a wide variety of pitches and sizes to choose from, this new line gives you the opportunity to fine-tune the performance of your slow flyer for more climb or faster cruise speeds. The props range in price from \$1.99 to \$9.99.

GWS; distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 355-9511; [www.horizonhobby.com](http://www.horizonhobby.com).





## DU-BRO LITE WHEELS

The folks at Du-Bro know how difficult it is to find the perfect wheels for your small-flyers. They must be light enough yet still able to contribute to the scale appearance that is important to you. The new Du-Bro Mini, Super and Diamond Lite wheels certainly fill that bill. They are some of the lightest wheels currently available, and they feature closed-cell, lightweight foam with nylon hubs. The Mini Lite Wheels are available in 1-, 1¼- and 1½-inch sizes; the Super Lite Wheels are available in sizes ranging from 1¾ to 3 inches; the Diamond Lite Wheels come in 2½-, 2¾- and 3-inch sizes. All of the new Du-Bro wheels range in price from \$3.65 to \$10.95 per pair.

Du-Bro Products Inc., 480 Bonner Rd., P.O. Box 815, Wauconda, IL 60084; (847) 526-2136; fax (847) 526-1604; rc@dubro.com; www.dubro.com.



There's nothing like a colorful plane zipping by to catch the attention of your flying buddies. Now you can soar through the sky in style with this new 78-inch-span aerobat from Super Kraft. The Texas Hurricane comes almost ready to fly, is constructed entirely of balsa covered in Ultracote and comes with a painted, fiberglass cowl. It requires a 1.20- to 2.40-size engine and a 4-channel radio with 6 servos. The Texas Hurricane ARF sells for \$437.77.

Kangke USA, 65 E. Jefryn Blvd., Deer Park, NY 11729; (877) 203-2377; fax (631) 274-3296; www.kangkeusa.com.

SUPER KRAFT

## Texas Hurricane ARF



TRU-TURN

## Ultimate Spinner



Although it was designed with the Hangar 9 1/3-scale CAP in mind, the new 4 1/4-inch-diameter Ultimate Spinner from Tru-Turn would be the perfect addition to many giant aerobatic aircraft. It's available in four slot configurations to accommodate standard and European-style props. The

Ultimate 2-Blade Spinner sells for \$97.95; the Ultimate Menz-Cut 2-Blade Spinner costs \$99.95; the Ultimate Menz-Cut, modified for Zenoah GT-80 engine sells for \$102.95; and the Ultimate Menz-Cut 3-Blade Spinner is listed at \$100.95.

Tru-Turn Precision Model Products; a division of Romco Mfg., P.O. Box 836, S. Houston, TX 77587; (713) 943-1867; www.tru-turn.com.

DYMOND MODELSPORTS USA LTD.

## Turbo Smart Charger

The new Turbo Smart Charger from Dymond Modelports is not just smart; it's practically brilliant. This baby can do it all! It features four-button programming, five main menus and 10 battery files. The Smart Charger automatically detects battery type, and it allows you to set the delta peak point sensitivity separately for Ni-Cd and NiMH batteries. The trickle-charge rate can be set up to 250mAh, and you can limit the maximum charge. It's available in two cycling modes: discharge to charge and charge to discharge. The two-line LED screen reads out the peak point, accumulated charge time, elapsed time and the average voltage during power discharge. An external temperature probe that terminates the charge if the battery's temperature exceeds 120-degrees F is available separately.

Dymond Modelports USA Ltd., 683 N. Main St., Oshkosh, WI 54901; (920) 303-1100; fax (920) 303-2021; dymondrc@execpc.com; www.rc-dymond.com.





GLOBAL HOBBY

## Cirrus 2M ARF Sailplane

If it's aerodynamics you want, look no further than the almost-ready-to-fly (ARF) Cirrus 2M Sailplane. The 2M has a double shear-webbed, double-spar, D-tube wing with an aluminum center joiner. Designed to provide optimum performance, the 2M's fuselage design maximizes tracking and responsiveness and retains simple elevator and rudder control. Its rudder size, matched with the dihedral, provides great maneuverability throughout the speed range. It's moderately sized, built-in spoilers ensure reliable spot landings without difficult and hard-to-control descents. The Cirrus 2M costs \$99.99.

Global Hobby Distributors, 18480 Bandilier Cir., Fountain Valley, CA 92728; (800) 854-8471; [www.globalhobby.com](http://www.globalhobby.com).



If you have as many RC aircraft mishaps as I do, CA is your single most important tool; in fact, I can never have enough. That's why I was excited to hear about this new, industrial-grade CA from Dave Patrick Models. Its unique cap provides an airtight seal and protects the tip from clogging with the use of an integrated pin that extends deep into the bottle. MAX is available in thin, medium, thick, flexible and odorless formulas; an accelerator is also available separately. It sells for \$2.99 (thin, medium and thick 20g bottle); \$4.99 (thin, medium and thick 50g bottle); \$3.49 (flexible 20g bottle); and \$5.99 (flexible 50g bottle).

Dave Patrick Models, 1811 E. 400 North Rd., Milford, IL 60953; (815) 457-3128; fax (815) 457-2938; [www.davepatrickmodels.com](http://www.davepatrickmodels.com).

DAVE PATRICK MODELS

## MAX



WESTON U.K.

## Magnum

Believe it or not, this British import is reported to be capable of speeds exceeding 200mph. Constructed of balsa and lite-ply, this 34.4-inch-wingspan sport plane comes almost ready to fly and requires only radio and engine installation. The Magnum is 42.1 inches long and weighs only 3.85 pounds. It requires a 4-channel radio with three standard servos and a .40 to .46 2-stroke engine. Install the WXL .46 engine with the recommended Weston tuned pipe and manifold and watch this baby streak across the sky.

Weston U.K., 84-88 London Rd., Teynham, Sittingbourne, Kent, ME9 9QH, England; [enquiries@westonuk.co.uk](mailto:enquiries@westonuk.co.uk); [www.westonuk.com](http://www.westonuk.com). ✈



SWB TURBINES

## Mamba Turbojet

If you're one of those jet enthusiasts who's always in search of something new, do we have news for you. SWB Turbines, which built and powered a vehicle for NASA's Hypersonic Program, introduces the 3.5-inch-diameter Mamba. This 7-inch-long powerplant produces 11 pounds of thrust using only 7.5 ounces of fuel per minute at full throttle. The 1-pound, 12-ounce unit comes with the Advanced Engine Controller (derived directly from SWB's military-grade engine controller), which monitors and controls all aspects of the engine for fail-safe startup and powerful, predictable operation. It sells for \$2,000.

SWB Turbines, 2485 Schultz Dr., Neenah, WI 54956; (920) 725-3721; fax (920) 725-3721; [info@swbturbines.com](mailto:info@swbturbines.com); [www.swbturbines.com](http://www.swbturbines.com).

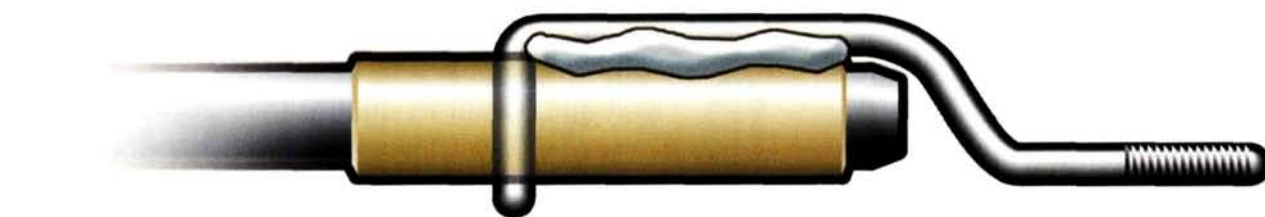
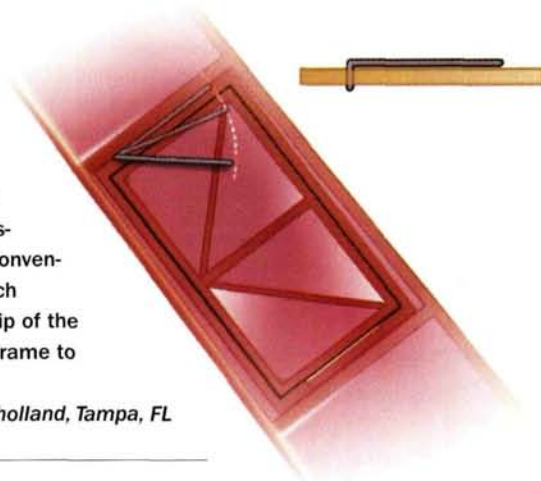


**SEND IN YOUR IDEAS.** *Model Airplane News* will give a free, one-year subscription (or one-year renewal, if you already subscribe) for each idea used in "Tips & Tricks." Send a rough sketch to *Model Airplane News*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we can't acknowledge each one, nor can we return unused material.

## SPRING WIRE HATCH LATCH

Here is a quick and easy method for making lightweight, low-drag hatch latches. Take a length of stiff wire at least as wide as your hatch, and bend it to a 60- to 70-degree angle. Take one side of the bent wire and sandwich it between two crosspieces in the fuselage structure. Bend the very end of the wire back up so that it extends up from between the crosspieces. Make sure that the wire on the other side of the angle bend lies flat across the hatch and holds it closed, then glue the crosspieces so they hold the wire securely. Hold the other side of the hatch in place with a conventional tab. When the wire is in the normal position (not under tension), it holds the hatch closed. When you want to remove the hatch, slide the wire over and clip it behind the tip of the wire that extends up from between the crosspieces. Glue a straight pin into the hatch frame to make it easy to lift off when the latch is opened.

*Fred Mulholland, Tampa, FL*



## HEAVY-DUTY PUSHRODS

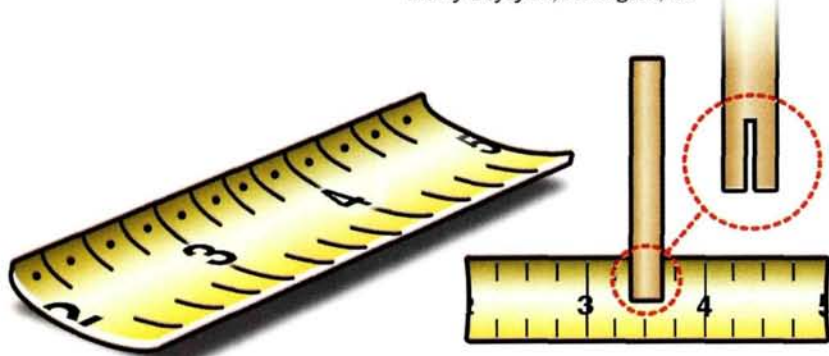
A little extra strength can mean the difference between a successful flight and a difficult repair project. For giant-scale or high-performance planes that put high stress on pushrods, here's a way to add some insurance. Select a dowel of the appropriate size for your model, and bevel the end to a depth of about  $\frac{1}{4}$  inch. Slide a 1-inch-long piece of brass tube over the dowel to form a sleeve; choose a diameter that fits snugly. When the tube is in place, drill a hole through the center of the sleeve and dowel that is the same diameter as your threaded rod. Bend the rod as pictured so that it fits all the way through the hole and then follows the contour of the dowel. Make sure the threaded rod is lined up as you want it, then solder it in place against the sleeve.

*Edward Fisher, Avon, CT*

## MEASURING IN TIGHT SPACES

Ever need to measure a spot that's too small to fit a ruler into, such as a motor mounting hole? An easy solution is to make a flexible mini measurer out of a piece of a broken metal tape measure. With a pair of tin snips, cut off a suitable length (3 inches work well), making sure you cut exactly on the inch marks. To reach into tight confines, hold the mini measurer with a pair of needle-nose pliers, or glue a permanent holder onto it as shown here.

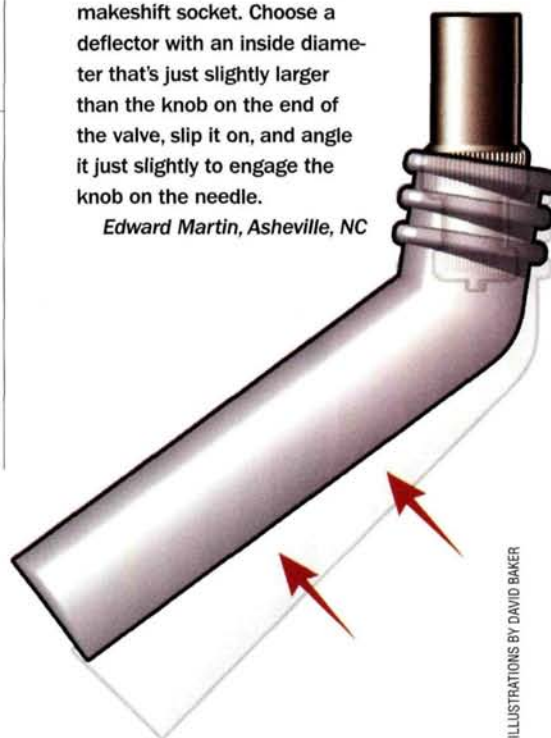
*Marty Boyajian, Torrington, CT*



## NEEDLE-VALVE ADJUSTER

Needle-valve adjustments can be tough to make, especially on scale models that have only a small adjustment hole in the cowl or an awkward valve angle. A safe and easy way to adjust the valve is to use an exhaust deflector of the appropriate size like a makeshift socket. Choose a deflector with an inside diameter that's just slightly larger than the knob on the end of the valve, slip it on, and angle it just slightly to engage the knob on the needle.

*Edward Martin, Asheville, NC*



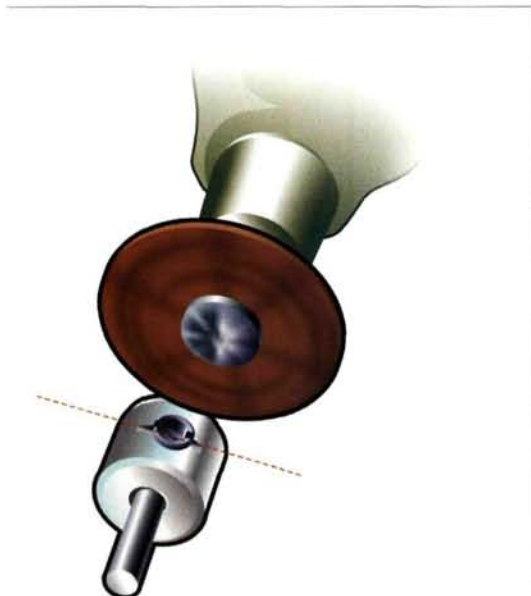
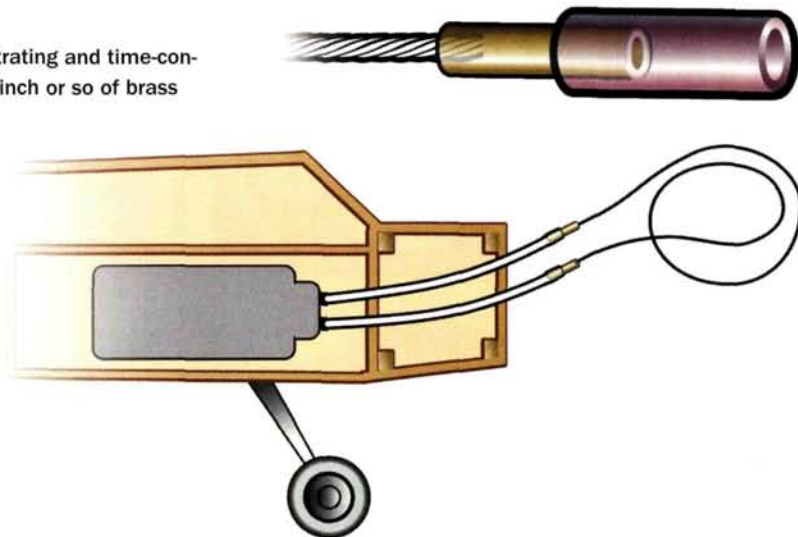
ILLUSTRATIONS BY DAVID BAKER



## THREADING FUEL LINES

Installing fuel lines in a newly built or repaired model can be frustrating and time-consuming. Instead of threading it through by hand, try this. Take an inch or so of brass tube that is the same diameter as your fuel line and solder it to a length of bicycle brake cable. Slip the end of your fuel line over the tube so it holds firmly. The cable is fairly stiff and should be easy to direct through the model. When it comes out the other end, grab it and pull your fuel line through.

*Richard Bond, Valencia, Spain*



## QUICK FIX FOR STUCK SETSCREWS

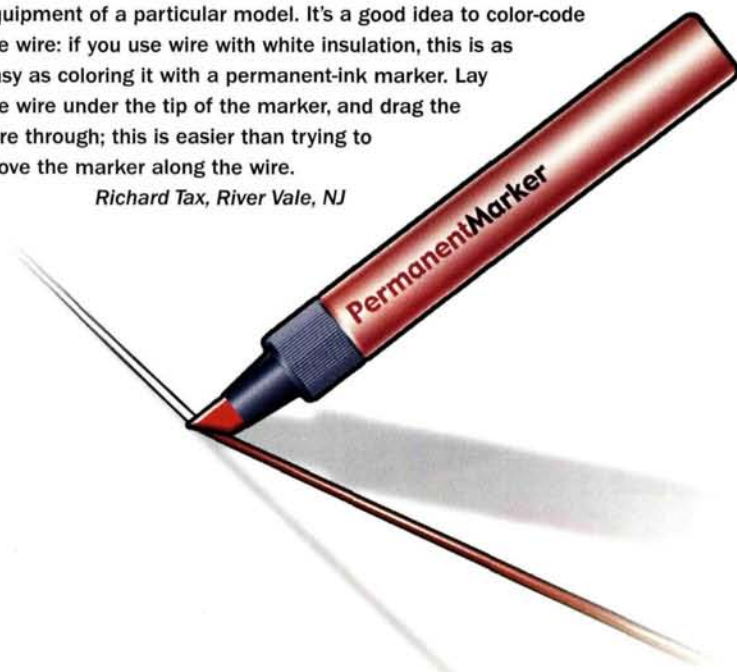
Stripped or corroded setscrews can be a real hassle to remove. The next time you encounter one, cut right into the middle with a rotary-tool cutoff wheel until you have a usable slot. With a narrow-blade screwdriver, loosen the stuck setscrew. If this doesn't work, continue to cut all the way down to the axle, and twist the collar with a pair of pliers to get it loose.

*Keith Abbott, San Diego, CA*

## COLOR-CODED WIRING HARNESS

Many builders make their own wiring harnesses to suit the size and equipment of a particular model. It's a good idea to color-code the wire: if you use wire with white insulation, this is as easy as coloring it with a permanent-ink marker. Lay the wire under the tip of the marker, and drag the wire through; this is easier than trying to move the marker along the wire.

*Richard Tax, River Vale, NJ*



## SOAP YOUR SCREWS

Wood screws don't always thread in as effortlessly as we'd like; it can be hard on your hands and on the model. Next time, try swiping the screw's threads across a damp bar of soap. The soap acts as a lubricant when wet, making it much easier to thread the screw in. It is particularly useful in tight areas where it is difficult to get a good grip on tools.

*Joe Radle, Huddleston, VA*



# 2001 EDITORS' PICKS

**SEND IN YOUR SNAPSHOTS.** *Model Airplane News* is your magazine and, as always, we encourage reader participation. In "Pilot Projects," we feature pictures from you—our readers. Both color slides and color prints are acceptable but please do not send digital printouts. We receive so many photographs that we are unable to return them. All photos used in this section will be eligible for a grand prize of \$500, to be awarded at the end of the year. The winner will be chosen from all entries published, so get a photo or two, plus a brief description, and send them in! Send those pictures to "Pilot Projects," *Model Airplane News*, 100 East Ridge, Ridgefield, CT 06877-4606 USA.

## GRAND PRIZE WINNER

**DON MURREY,**  
Kingsgrove, New South Wales,  
Australia  
**JU-87B-2 STUKA**

This outstanding scratch-built JU-87B-2 Stuka dive-bomber from Don Murrey of Kingsgrove, New South Wales, Australia, has the honor of being chosen as the 2001 "Pilot Projects" winner. First appearing in our September 2001 issue, this amazing plane was scaled up from a 1/24-scale plastic model. Don's 72-inch-wingspan model weighs 14 pounds and is powered by an O.S. .91 FSR. The Stuka features functional, oil-damped Oleo struts, flaps, dive brakes, a bomb-release mechanism and landing and navigation lights. Don's attention to detail and his ingenuity captures \$500, a one-year subscription to *Model Airplane News* and a *Model Airplane News* cap and T-shirt. Congratulations, Don!



## HONORABLE MENTION



**TONY KAMEEN,**  
Moreno Valley, CA  
**P-51D MUSTANG**

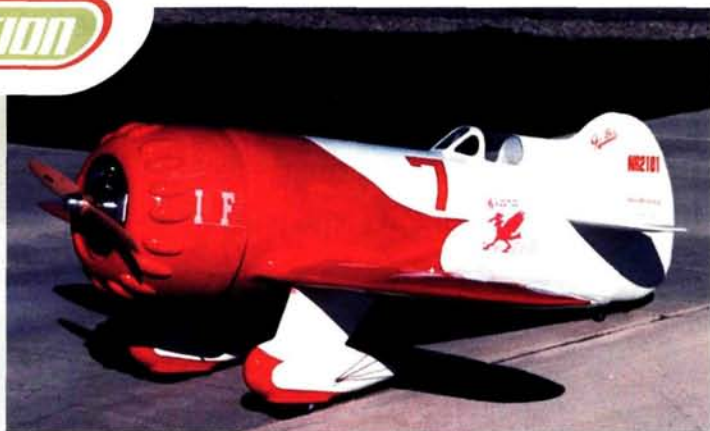
Mustangs are always a favorite of modelers everywhere, and this beautiful P-51D from Tony Kameen of Moreno Valley, CA, is certainly a favorite of ours. This 9-pound, 60-inch-wingspan warbird, built from a set of modified Bryan Taylor plans, appeared in our October 2001 issue. It's covered with Goldberg Ultracote, Top Flite MonoKote and paint and finished with Mylar insignia. Tony scratch-built the struts, drop tank and tailwheel mechanisms. Modeled after Lt. Tom Leaver's plane of the 47th Fighter

Squadron, 15th Air Force, this impressive Mustang deserves an honorable mention. Tony wins a copy of "Building Techniques" (a book from Air Age Inc.'s "Master Modeler Series"), a one-year subscription to *Model Airplane News* and a *Model Airplane News* cap and T-shirt. Nice job, Tony!

## HONORABLE MENTION

**GEORGE WARDLEIGH,**  
Ogden, UT  
**GEE BEE RACER**

Golden Age Racers have a certain appeal, and this 1/8-scale Gee Bee R1/R2 built by George Wardleigh of Ogden, UT, certainly has charisma. It was scratch-built, is powered by a Quadra 100 twin and controlled by a Futaba FM radio. This model appeared in the November 2001 issue, and we're delighted to reward George's effort with a copy of "Building Techniques" (a book from Air Age Inc.'s "Master Modeler Series"), a one-year subscription to *Model Airplane News* and a *Model Airplane News* cap and T-shirt. Way to go, George!





## Gene Gray, Terre Haute, IN MARQUART CHARGER

The Terre Haute R/C Club must be proud to have Gene Gray's Marquart Charger on its flightline. Gene's beautiful biplane is  $\frac{1}{4}$  scale and has a 72-inch wingspan. Covered in MonoKote and trimmed with LustreKote, the Charger weighs in at 16½ pounds. For power, Gene uses a Moki 1.80 and for control, a Futaba Super 7 radio. One of his great scale details is the full cockpit with a detailed instrument panel. And what open-cockpit biplane would be complete without a pilot?



## Robert Gillespie, Twin Falls, ID PBY CATALINA

Avid modeler Robert Gillespie's latest project is this colorful PBY from a G&P kit. It's powered by twin .28 engines and uses a Futaba 8UHF with 6 servos for guidance. The "Cat" features a fiberglass fuselage and floats that retract into the wingtips. The foam-core wing and tail surfaces are balsa sheeted, covered with clear MonoKote and then sprayed with Top Flite LustreKote. Robert reports that the Catalina is very aerobatic and will do loops and rolls and fly inverted very well. On its first flight, one engine quit, and Robert notes that one-engine performance is no problem.

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**Trafton Moeller, Puyallup, WA**  
**GENTLE LADY**

This Gentle Lady is 12-year-old Trafton's first effort at building an RC plane. He built the Lady, without any help, in about a week. For covering, Trafton bought white and orange MonoKote, and like most of us when we were just beginning, used a clothes iron and a hair dryer to apply and shrink the MonoKote. According to Trafton, he has only hand-launched and glided his plane on nearby hill, and it glides well. He's saving up for a radio that he hopes to purchase very soon. Nice job, Trafton!



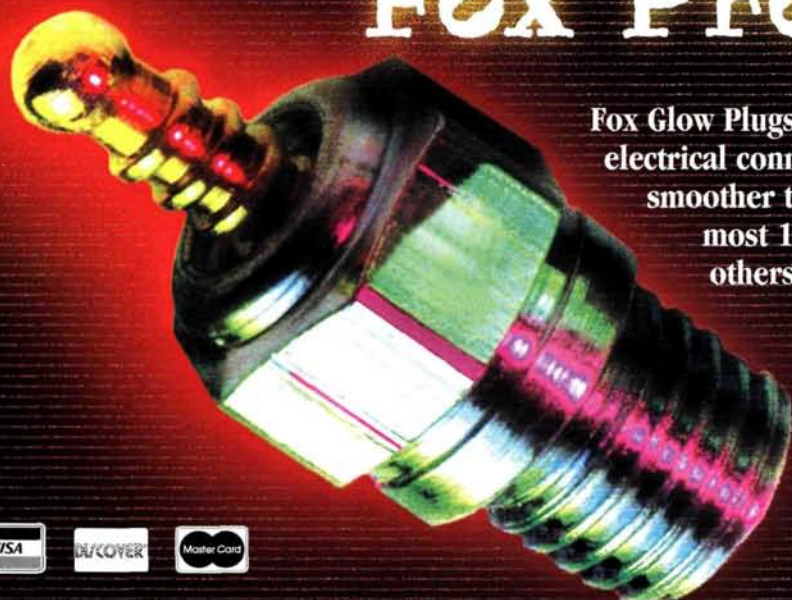
**Dick Hansen, Portland, OR**  
**MACCHI M-7**

Well-known scale competitor, Dick Hansen, is the proud owner/pilot of this very pretty 3 Sea-Bees Macchi M-7. The Macchi is scaled at  $\frac{1}{6}$  and has a wingspan of  $79\frac{1}{2}$  inches. Powered by a Saito 1.80 4-stroke and swinging a Zinger 18x8 pusher prop, the  $16\frac{1}{2}$ -pound Macchi gets up on step very quickly. Covered with antiqued SolarTex, the Macchi has hands-off flight performance, according to Dick. The Macchi single-seat fighter was used by the Swedish and Italian Navies, and in 1920, Italy won the Schneider Trophy with a Macchi M-7 at a speed of 117mph.



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*This striking Peter Barth Junkers JU-52 3M garnered the Best Built-Up Kit award for builder John Topper.*

# ***U.S. Scale Masters CHAMPIONSHIP***




## **FIRST PLACE EXPERT**

Expert Scale was a very close race, with Jeremy Fursman ultimately coming out on top with his Tiger Moth biplane. Jeremy won seventh place with the same model at last year's championship. His static score of 97.75 was fourth best, and no one could come close to his flying skill. His 93.25 flight score was more than 4 points better than any other contestant's, and the perfect calm-weather conditions certainly helped him. He ran his Laser 150 4-cycle engine at reduced throttle to provide an extremely scale-like flight performance, and his tiger-stripe paint job certainly stood out in the air (he used Nelson Hobby Paint). Interestingly, the Airtronics radio system employed only 4 channels with five servos. This shows that you don't need a 10-channel radio to win championship scale events.



Second place went to Shallesh Patel for his magnificent F-86 Saber jet. Shallesh is one of the best competitors with jet aircraft; his scale subjects are flawless, and he knows how to fly his models very well. His entry was from his own plan; it had a 96-inch wingspan, weighed 45 pounds and was powered by an AMT turbine engine. His static score of 98 tied him for second best. His aircraft was covered with Presto simulated aluminum covering and PPG paint. A Futaba 12-channel was used with 12 servos. This was the first time that this F-86 was entered in a Scale Masters Championship. Watch for this aircraft at 2002 scale competitions; it should be tough to beat.





Of special interest was Bob Benjamin's 10th-place electric-powered Aeronca K. This is the first time an electric model has made it into the top 10 in Expert at a Scale Masters Championship. This model will be flown as Bob's entry at the World Scale Championship to be held in Canada this year. The  $\frac{1}{4}$ -scale model is powered by an Astro 60, and the 108-inch-wingspan plane weighs only 16.5 pounds. An Airtronics radio was used; the paint is by Stits.

## The ultimate in scale competition

by Jerry Nelson

**T**he U.S. Scale Masters Championship is one of the most highly respected RC competitions in the world. More than 100 contestants were eligible to compete this year, and they represented the finest in building and flying skills from throughout the country. The Scale Masters isn't open to just anyone; every participant had to qualify by placing in the top 30 percent of finishers in one of 21 regional events. There were a total of 39 entries: 32 in Expert and seven in Team. The event was held at Lenhardt's Airpark, a private airport in Hubbard, OR, about 45 minutes south of Portland. This was the perfect environment for the Scale Masters; it featured a 3,000-foot paved runway with an excellent grassy area next to the pavement. Many of the contestants flew off the grass rather than the paved surface. An estimated 3,000 spectators attended, and 450 schoolchildren watched the noontime aircraft display on Friday.



Nelson Hobby Paint helped Wayne Frederick net 97.75 points in static competition for his Fokker D.VIII—fourth best and equal to the overall winner's static score.





**Second place in Team went to Dick Heinige's Fokker D.VII; it was well flown by Jason Tait and finished only 1.16 points behind the winner.**

The U.S. Scale Masters Association, which is based in the Portland area, organized the event. Chairman Earl Aune served as the contest director with the assistance of contest manager Gary Norton. The host club was the Portland SkyKnights. Many other volunteers from other local clubs also helped. Four flight-

lines were in use at all times. There were five sets of two judges, and five contest rounds were flown; each contestant was judged once by the five sets of judges. This scoring system worked very well; the top three winners' scores were very close, and coming into the final round on Sunday morning, no one was certain who

the ultimate victors would be.

Two competition events were held: Team and Expert. The Team event allows the builder to have someone who is perhaps more skilled pilot the aircraft. The Expert event is more traditional in that the builder pilots his own model. Individual championship awards are given for both events, and there are many special "best of" awards.

## RULES

For modelers who have not attended or competed in scale competitions, here is a brief overview of the rules. The actual competition (Team and Expert) is composed of two parts—static judging and flight performance—each scored on a basis of 100 points. Thus, a perfect score would total 200 points. The static judging is done before the actual flying, and one day of the event is devoted to this portion of the competition. Of the 100 static points possible, 40 points are for accuracy of outline, 25 points for color and markings and 35 points for craftsmanship, and these are awarded in ¼-point increments. The contestant must provide 3-view drawings of the entry as well as photos and color documentation.

## U.S. SCALE MASTERS WINNERS

AWARD	RECIPIENT	AIRCRAFT
1st-place Expert	Jeremy Fursman	de Havilland DH82A Tiger Moth
2nd-place Expert	Shailesh Patel	F-86 Sabre Jet
3rd-place Expert	John Cole	Hansa-Brandenburg C-1
1st-place Team	R. Salles and E. Esteves	Spacewalker
2nd-place Team	D. Heinige and J. Tait	Fokker D.VII
3rd-place Team	Q. Quigley and R. Babcock	Ford Flivver
<b>SPECIAL AWARDS</b>		
Best Mission, Expert	Jerry Holcomb	Dewoitine 338
Best Mission, Team	D. Heinige and J. Tait	Fokker D.VII
Most Realistic Flight, Expert	Jerry Holcomb	Dewoitine 338
Most Realistic Flight, Team	D. Heinige and J. Tait	Fokker D.VII
High Flight	Jeremy Fursman	de Havilland DH82A Tiger Moth
Harris Lee Lifetime Achievement	Que Quigley	
Pilots' Choice	Shailesh Patel	F-86 Sabre Jet
High Static	John Cole	Hansa-Brandenburg C-1
Engineering Achievement	Ken Safer	Bristol Beaufighter
Best Scratch-Built	B. Ensley and B. Boland	Stinson
Best Built-Up Kit	Joe Topper	Junkers JU-52 3M
Best WW II	Daryl Rolla	Hawker Sea Fury FBII
Best WW I	John Cole	Hansa-Brandenburg C-1
Best Documentation	Chris Spangenberg	F4U Corsair
Best Markings	Shailesh Patel	F-86 Sabre Jet
Best Jet	Shailesh Patel	F-86 Sabre Jet
Best Military	Chris Spangenberg	F4U Corsair
Best Civilian	Jeremy Fursman	de Havilland DH82A Tiger Moth
Best Golden Age	C. Maitre and J. Elliot Jr.	1930 WACO CTO Taperwing



**Top:** Team results were very close, with only 7.66 points separating first from fifth. First place went to Eduardo Esteves, who came all the way from Brazil to fly a highly detailed Spacewalker built by Ronaldo Salles. His static score of 97.75 tied for fourth place among all contestants. **Bottom:** this unusual Ford Flivver garnered third place in Team competition. Its static score of 97.25 was among the best; the plane flew very realistically.





## THIRD-PLACE EXPERT

John Cole received a well-deserved third place for his Hansa-Brandenburg C-1. His static score was 98.75, the highest of the competition. John is recognized as a master builder of WW I aircraft, and he designed the model himself based on original factory data. The model was quite large (122-inch wingspan), but it was very light for its size at just 19.5 pounds. A SuperTigre 3000 provided just the right amount of power for the model to fly very realistically. The guidance system was a JR radio with just four servos.

The static judging took place at the Proctor Enterprises factory about 15 minutes north of the flying site. The Proctor facility is in a beautiful park-like setting surrounded by a grove of trees. As a bonus to contestants and spectators alike, Proctor's manufacturing facility was open to anyone who wanted to see how its WW I kits are made.

The flight-performance score comprises nine maneuvers and a realism-of-flight score. The pilot chooses his maneuvers from an extensive list, selecting those that the full-scale aircraft flew; bombers drop bombs, fighters perform combat maneuvers, aerobatic models do advanced aerobatic maneuvers, and Cubs do what only Cubs can do. The flight-realism score includes "scale speed." The scores of the best three flights are averaged; a maximum 100 points are possible.

### HIGHLIGHTS

One highlight of the weekend was the full-scale airshow. Sam Richardson, an active modeler and a full-scale warbird pilot (he flies a Yak 11 at the Reno Air Races) flew his magnificent show-quality Stearman in formation with an AT6. There were also some low-level, high-speed flybys with a P-51.

A tradition of the U.S. Scale Masters Qualifiers and Championship is the public viewing of the models during the noontime break. All the models are lined up along the middle of the runway. The pilots stand next to their aircraft so they can answer any questions from spectators about their models and so the spectators can take their photos up close. This is an excellent public-relations opportunity!

The final scores show the results of the competition. It is always interesting to see whether any particular type of aircraft had an advantage, but since there hadn't been any wind problems, none had. A large, high-wing-loading model such as a jet or a warbird would have had an advantage in windy conditions. As it was, there was a nice variety in the top places. The top 10 in Expert consisted of four vintage biplanes, one jet, a 3-engine German WW II transport, two warbirds, an aerobatic model and a classic 1940 vintage Aeronca K. The remaining models were of various types, including three that were electric powered.

Overall, this year's Scale Masters was a great success. The models were among the best anywhere, the site was superb and, most important, both the competitors and spectators enjoyed themselves. The location of next year's event is not yet definite, but it will most likely be in the Northeast sometime in late September or early October. To get the latest developments, visit the Scale Masters website at [www.scalemasters.org](http://www.scalemasters.org). The Scale Masters can be contacted at 21952 Airport Rd., Aurora, OR 97002; (503) 678-6036; [jenseninc@msn.com](mailto:jenseninc@msn.com). ✈

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The Engineering Achievement award went to Ken Safer for this Bristol Beaufighter.



# PILOT PAT

## FIND THE BEST PILOT FOR YOUR PLANE

**W**hen it comes to the illusion of scale, one of the most important ingredients is the scale pilot figure that sits in the model's cockpit. Nothing is worse than seeing a beautifully built scale model airplane fly by without someone manning its controls. Yet for many modelers that little intrepid aviator is an afterthought. Any model, scale or sport, will benefit from a little life inside it. This guide includes the most popular pilot figures available today. Some come painted from the factory, while others have to be assembled and painted by the modeler. These lightweight crewmen in a variety of styles are available in several sizes, most ranging from 1/8 to 1/32 scale.

For the sport flier and scale competitor alike, a model cockpit that's occupied goes a long way in making the aircraft look more like the real thing.



### WILLIAMS BROS. INC.

For nearly 40 years, modelers have turned to Williams Bros. for their scale pilot figures. Made of injected-molded plastic, these figures come in several styles, including standard, racing, sportsman and military. Available in 1/4, 1/8, 1/16, 1/32 and 1/64 scale, Williams Bros. pilots come in kit form and must be glued and painted.

■ FROM \$2.35 TO \$8.55.

Williams Bros. Inc., 1119 Los Olivos Ave., Unit 3, Los Osos, CA 93402; (805) 534-1307; fax (805) 534-1366; info@williamsbrosinc.com; www.williamsbrosinc.com.

### ACADIAN RC PRODUCTS

In production since 1978, the 3/4- and full-figure pilots offered by Acadian RC Products are available in five 1/4- to 1/32-scale sizes. All are made of vacuum-formed, high-impact polystyrene, and they come unpainted. You can find Acadian's authentic-looking Old Timer, WW II Army, WW II Navy, WW II German and Jet Pilot figures in most hobby shops. All Acadian figures are historically accurate, and each weighs less than 1 ounce.

■ \$8.95 EACH.

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Acadian RC Products, 22030 Fiddletown Rd., Volcano, CA 95689; (209) 296-1262; info@acadianrc.com; www.acadianrc.com.



### CRAZYPILOTS

CrazyPilots is a unique company; it offers very scale-like pilot figures and a service for producing miniature busts of people from photos. Yes, you can have a scale pilot figure molded and painted to look exactly like you. Simply send in your front- and side-view pictures, and soon you'll have your very own "Mini Me" (with accessories) sitting in your next model. These figures are made out of hollow molded plastic resin to minimize weight, and they are finely detailed and hand-painted. Standard noncommissioned pilot figures come in various styles and sizes.

■ FROM \$13 TO \$220.

CrazyPilots, c/o Byron Jungjareon, 2268 Delvin Way, So. San Francisco, CA 94080; (650) 737-9355; CRAZYPILOTS@aol.com; www.crazypilots.com.





# ROL

by the staff of Model Airplane News



## MGA ENTERPRISES

MGA designs and manufactures 19 pilot figures in various styles. Sizes range between 1/8 and 1/6 scale, and all figures come fully assembled, painted, equipped and posable. The 1/4-scale busts are available in WW I Aviator, WW II Navy/Marine, U.S. Air Force and Civilian/Sport Flyer. The 1/6-scale Aces of WW II are available in USAAF, German Luftwaffe, Imperial Japanese Navy and Top Gun Jet Pilot styles. The 1/8-scale figures come in four Top Gun Jet Pilot versions. The 1/6-scale full-figure pilots include WW II Navy/Marine, Commanding Officer, Civilian/Sport and Jet Pilot models. A 1/8-scale Civilian/Sport Flyer bust is also available. All figures are finely detailed to achieve optimum realism.

■ FROM \$24.95 TO \$50.

MGA Enterprises, P.O. Box 5631, Fresno, CA 93755; (559) 224-4170; fax (559) 224-2789; [mgapilots@psnw.com](mailto:mgapilots@psnw.com); [www.mgapilots.com](http://www.mgapilots.com).

## BBI ELITE FORCE AVIATORS

Originally intended for the collectible action-figure market, these aviator figures are the ultimate in scale fidelity, and they are perfect for 1/6-scale aircraft. Available in two modern jet and two WW II styles, bbi aviator figures have finely detailed accessories that include faithfully reproduced cloth flight suits, helmets and visors/goggles, oxygen masks and hoses, parachutes and straps, watches, zippers, buckles and a variety of other equipment.

■ FROM \$29.99 TO \$49.99.

bbi; a division of Blue Box Toys, 200 Fifth Ave., New York, NY 10010; (212) 255-8388; [www.blueboxtoys.com](http://www.blueboxtoys.com); [bbusa@blueboxtoys.com](mailto:bbusa@blueboxtoys.com).

## LIFE-LIKE SCALE RC PILOTS

Manufactured and distributed by Model Graphics, Life-Like pilots are hollow-cast from two-part polyester resin to produce very light and realistic figures. They come in various styles, including Airshow Pilot, Sport Pilot and Afro-American Airshow Pilot, that range in size from 20 to 33 percent. WW I and WW II military pilots are also available in American Air Force, Navy, Marine, Tuskegee Airmen, British, Japanese and German versions. The military figures come in 1/8- through 1/6-scale sizes.

■ FROM \$29.95 TO \$39.95.

Life-Like Scale RC Pilots; a division of Model Graphics, 312 Marin Oaks Dr., Lafayette, LA 70501; (337) 269-5177; [denny@model-graphics.com](mailto:denny@model-graphics.com); [www.lifelikepilots.com](http://www.lifelikepilots.com).



## CLARK INDUSTRIES

These 1/4-scale WW II RCAF/RAF pilot figures are made of lightweight molded latex are fully detailed with clear goggles, separate helmet and oxygen mask, separate head and hands for positioning and a separate Mae West life preserver. Also available are parachute harnesses with a quick-release box and buckles.

■ \$45 (UNPAINTED); \$80 (PAINTED).

Clark Industries Inc., R.R. #4, Tottenham, Ontario, Canada L0G 1W0; (905) 936-2131; fax: (905) 936-2131; [clarkind@istar.ca](mailto:clarkind@istar.ca); [www.clarkindustries.on.ca](http://www.clarkindustries.on.ca).







## HOBBY LOBBY

Hobby Lobby offers a total of 15 lifelike pilot figures in just about every size and style you can imagine, including civilian, early aviation, WW I, WW II, jet and female. All of the pilots come hand-painted and can be cut to fit more narrow cockpits. They are molded of hard rubber and range in height from 1 1/8 to 6 inches.

■ FROM \$8.10 TO \$24.90.

Hobby Lobby Intl., 5614 Franklin Pike Cir., Brentwood, TN 37027; (615) 373-1444; fax (615) 377-6948; [www.hobby-lobby.com](http://www.hobby-lobby.com); [sales@hobby-lobby.com](mailto:sales@hobby-lobby.com).

## ACE HOBBY

Over the years, Ace's famous Capt. Eddie bust has become something of a legend in the world of pilot figures—and it's still available today. Capt. Eddie is made of latex and is available in 1/6 and 1/4 scale. The unpainted, 1/4-scale figure arrives in halves that must be assembled.

■ \$6.99 (1/6 SCALE); \$9.99 (1/4 SCALE).

Ace Hobby Distributors, 116 W. 19th St., Higginsville, MO 64037; (660) 584-6704; [www.acehobby.com](http://www.acehobby.com); [service@acehobby.com](mailto:service@acehobby.com).



## AXEL SCALE PILOTS

All Axel pilot figures are handmade in Germany. Each figure is unique with subtle difference in the clothing, eye and hair colors. The bodies and limbs are flexible, so the figures fit precisely into the cockpits of various types of models. Corresponding handmade accessories include seatbelts, parachute harnesses, hats, eyeglasses and wristwatches.

Because these pilot figures are individually handmade, please allow plenty of time for delivery.

Pilots are available in 1/4, 1/3.5, 1/3, 1/2.5 and 1/2 scales and as full-body, half-body and bust types.

■ \$106 TO \$175 (FULL BODY); \$61 TO \$121 (HALF BODY); \$41 TO \$96 (BUST).

Axel Scale Pilots, Hannelore Pfannmüller, Robert-Bunsen Str. 62, 65428 Rüsselsheim, Germany; [www.axels-scale-pilots.de](http://www.axels-scale-pilots.de); [orders@towerhobbies.com](mailto:orders@towerhobbies.com); email [info@axels-scale-pilots.de](mailto:info@axels-scale-pilots.de).



## VAILLY AVIATION

Based on the classic line of Officers and Gentlemen figures, Vailly Aviation offers lightweight, realistic civilian and military scale figures in 1/8, 1/4, 1/6, 1/3 and 1/2 scale. They come unpainted and in kit form, but all can be easily assembled and configured to fit a variety of cockpit layouts. Both full-figure pilots and busts are available, as are accessories like sunglasses, headphones, hats and helmets.

■ FROM \$12 TO \$30.

Vailly Aviation, 18 Oakdale, Ave., Farmingville, NY 11738; (631) 732-4715; [vaillyav@optonline.net](mailto:vaillyav@optonline.net); [www.vaillyaviation.com](http://www.vaillyaviation.com).







## PARLOR CITY PILOTS

If you're looking for something a little more original to ride in the cockpit of your next project, check out this one. Parlor City Pilots created this one-of-a-kind figure for modelers who are tired of the same old thing. This figure comes in two unpainted halves. When assembled, it stands 2¾ inches tall and 3½ inches wide. It's made of durable polyurethane resin.

■ \$7.95.

Parlor City Pilots, 39 Sunrise Way, Bluffton, IN 46714; msark@parlorcity.com.

## DGA DESIGNS

DGA pilot figures are available in male bust, female bust and full-figure kits and come unpainted but with a complete set of assembly instructions. Made entirely of latex, the figures come in 1/8- through 1/2-scale sizes, and each weighs less than 2 ounces. These Darn Good Airmen are available in sportsman, barn-stormer, pilot and jet pilot versions.

■ FROM \$6.28 TO \$15.95.

DGA Designs, 4177 Orleans Rd., Canandaigua, NY 14424; (716) 396-5964; fax (716) 393-1838; info@dga designs.com; www.dga designs.com.



## SIG MFG.

Sig Mfg. pays tribute to "the First Lady of Modeling" with this 1/4-scale figure of Hazel Sig—the perfect addition to any giant-scale model. All Hazel Sig figures are made of flexible vinyl latex rubber and weigh 3 to 4 ounces each. They have a 5½-inch shoulder width and are 5¾ inches tall. Hazel Sig is available in three versions: Hazel Pilot with Hair (shown here), Hazel Pilot with Baseball Cap and Hazel Pilot with Helmet designed for open-cockpit models. All three versions come with complete painting and assembly instructions as well as Sig decals.

■ \$14.95 EACH.

Sig Mfg. Co., P.O. Box 520, Montezuma, IA 50171; (641) 623-5154; fax (641) 623-3922; mail@sigmfg.com; www.sigmfg.com.

## PAINTING PILOTS WITH ACRYLICS

When painting soft latex pilot figures, nothing beats acrylic paint. Available in most hobby shops and many craft stores, acrylics are water based and very inexpensive when compared with model paints. Acrylics are very similar to oil paints and must be thinned a bit before they are applied to the object you want to paint. You can spray acrylics, but you get excellent results by simply using a brush. Here are a couple of tips.

- Mix colors on a paper plate used like an artist's palette. Start with white and add color to the base white.
- Apply lighter colors first and then apply darker ones.
- To add realism, add highlights and lowlights to your base colors. Mix a little white and black into the colors to produce the lighter and darker shades.
- Use a heat gun or a hair dryer to speed up drying time between coats.
- Keep a clean cup of water and a supply of paper towels nearby to clean your brushes.

If you haven't tried acrylic craft paint before, you're in for a treat. It's very user-friendly, dries quickly and is available in a myriad of colors.







### CENTURY JET MODELS

Century Jet Models' fighter pilots come in several sizes that will perfectly complete the cockpit of your new scale jet. Century offers full-figure fighter pilots in  $\frac{1}{10}$  and  $\frac{1}{8}$  scale, fighter pilot busts in  $\frac{1}{10}$  and  $\frac{1}{8}$  scale, WW II pilots in  $\frac{1}{8}$  and  $\frac{1}{6}$  scale and a  $\frac{1}{6}$ -scale WW II British pilot. All of Century Jet's pilots come completely painted and weigh less than 5 ounces each.

■ FROM \$25.95 TO \$40.

Century Jet Models, 11216 Bluegrass Pkwy., Louisville, KY 40299; (502) 266-9234; fax (502) 266-9244; [www.centuryjet.com](http://www.centuryjet.com); [sales@centuryjet.com](mailto:sales@centuryjet.com).

### HANGAR 9

Hangar 9 produces a wide variety of pilot figures that range in size from  $\frac{1}{4}$  to  $\frac{1}{10}$  scale. Among the 40 models available are civilian, jet and sportsman pilots, WW II British, Japanese, German and American pilots and WW I American pilots. Hangar 9 figures are made of durable, lightweight latex rubber and can easily be trimmed for a custom fit. The figures come unpainted but can be finished with standard acrylic paint. They also feature several scale details, including oxygen masks, headsets and helmets.

■ FROM \$7.95 TO \$14.95.

Hangar 9; distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 352-1913; [www.horizonhobby.com](http://www.horizonhobby.com).



### PILOTS BY DIANE

Each figure from Pilots by Diane is made of molded latex, and the clothing is individually hand-stitched, including minute details such as patches. The figures range in size from  $\frac{1}{4}$  to  $\frac{1}{2}$  scale and are available as full figures and busts. All of the pilots are very light, and they come in a variety of styles that include civilian, military, female and even a flying farmer.

■ FROM \$20 TO \$150.

Pilots by Diane, P.O. Box 1865, Champlain, NY 12919; (514) 246-4543; [pilots-by-diane@netc.net](mailto:pilots-by-diane@netc.net).



### NELSON HOBBY SPECIALTIES

Europe's most popular RC pilot figures are available in the U.S. through Nelson Hobby Specialties. Pete's Scale Pilots are made of flexible, lightweight latex rubber and are individually hand-painted for true scale detail. Optional accessories, including glasses, hats and microphones, are also available, and the heads are posable. Bust pilots come in  $\frac{1}{6}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ,  $\frac{1}{2}$  scale as well as in 29- and 40-percent sizes. Full-figure pilots are offered in  $\frac{1}{6}$ ,  $\frac{1}{4}$ , and  $\frac{1}{8}$  scale and in 29-percent size. Civilian and military versions of the pilot figures are available.

■ FROM \$49.95 TO \$119.95.

Nelson Hobby Specialties, 2900 SW Cornelius Pass Rd., #762, Hillsboro, OR 97123; (877) 263-5766; fax (503) 645-1492; [www.nelsonhobby.com](http://www.nelsonhobby.com).

### PERSONALIZED PILOTS

If you want to add some extra scale realism to your pilot figure, check out Faye Stilley's article, "How to personalize your pilot," on the Web at [www.modelairplanenews.com/how\\_to/personalize\\_pilot1.asp](http://www.modelairplanenews.com/how_to/personalize_pilot1.asp). With a little paint and some putty, you, too, can transform any pilot figure into a captain worthy of your scale plane. This article first appeared in the June 2001 issue of *Model Airplane News*. ✈





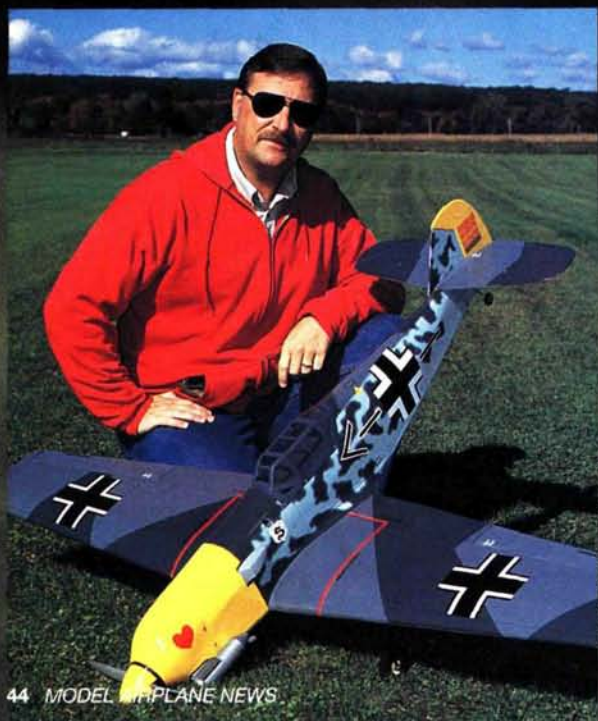




# Kyosho Messerschmitt Bf109E

*Classic German  
warbird ARF*

by Rick Bell



It was only a matter of time until Kyosho created a complement to the great Spitfire in its Super Quality Series (SQS) warbirds. The .40-size Messerschmitt Bf109E is an obvious choice. With these two planes, you can create some thrilling Battle of Britain reenactments with your flying buddies. Well, Kyosho really came through! After reviewing the Kyosho Spitfire in November 2000, I was eager to take a look at its Bf109E.

#### WHAT'S IN THE BOX?

When I opened the box, I was not surprised to see a very nice-looking Messerschmitt with an authentic WW II camouflage paint scheme on the fuselage and a splinter scheme on the wing and tail. Like the Spitfire, this model comes completely covered—no painting required. The Messerschmitt comes in a standard almost-ready-to-fly (ARF) format, i.e. it includes fuselage, wing halves, vertical fin/rudder and stabilizer/elevators, and it is assembled using conventional construction methods. All of the hardware needed to complete the model is also included. The hinges on the control surfaces are installed but not glued into place. The kit also provides the fuel tank, pushrods, wheels, a canopy, an engine mount, a painted and fiberglass-reinforced cowl, a



## SPECIFICATIONS

**MODEL:** Messerschmitt Bf109E

**MANUFACTURER:** Kyosho

**DISTRIBUTOR:** Great Planes Model Distributors Co.

**TYPE:** sport-scale ARF warbird

**WINGSPAN:** 56 in.

**LENGTH:** 47½ in.

**WING AREA:** 527 sq. in.

**WEIGHT:** 5 lb., 3 oz.

**WING LOADING:** 25 oz./sq. ft.

**RADIO REQ'D:** 4-channel w/5 servos (fixed gear); 5-channel w/6 servos (retracts)

**RADIO USED:** JR X388S receiver w/5 JR 517 servos and one JR NES 703 servo (retracts)

**ENGINE REQ'D:** .40 to .46 2-stroke or .50 to .56 4-stroke

**ENGINE USED:** O.S. .46FX

**PROP:** APC 11x6

**FUEL:** Cool Power 15% nitro

**PRICE:** \$199.99

**FEATURES:** built-up, all-wood ARF kit includes fuel tank, fixed gear, wheels, all needed hardware, a fiberglass, gelcoated cowl, color-matched spinner and illustrated instruction manual.

**COMMENTS:** this quick and easy-to-build ARF Messerschmitt has trainer-like flight qualities that make it a great Sunday flyer. Its stunning looks will make it a hit at any flying field.

### HITS

- Quick, easy assembly.
- Great-looking paint scheme.
- Very nice presentation in the air.
- Good flight qualities.

### MISSES

- None.





spinner and fixed main gear. The instruction manual shows how to install retracts if you want them—which I did!

### CONSTRUCTION

• **Wing assembly.** The instruction manual mostly comprises drawings and pictures; there is very little written instruction. Because these kits are so easily built, the manual is more than enough help to complete the model.

I began by hinging the ailerons to the wing using the provided CA-type hinges. Following the instructions, I cut out openings for the servos in the bottom of each wing panel. Just to be safe, I added extra CA to the gussets for the servo hatches.

I built the servo mounts, added the servos to them and then secured the assemblies to the wing panels. You'll need two servo extensions for the servos. Each wing panel contains a piece of string to help thread the servo extension through. Using the supplied parts, I added the pushrods that join the servo and the ailerons.

The clevises are made of aluminum and must be secured to the pushrods with grub screws. Be sure to file a flat surface on the pushrods so the grub screws can get a better bite, and use thread-lock to secure them in place. I also used a 2mm screw to attach the clevis to the control horns, and that allowed me to use a 2mm nut on the other side of the clevis for more security. I did the same for all the pushrods and control hookups.

• **Retracts.** Next, I installed the retracts. Though the manual recommends that the wing halves be joined first, it's easier to



*The Kyosho Messerschmitt straight out of the box. It comes in a standard ARF format, and all of the hardware needed to complete the model is included.*

work on a single wing panel than it is to work on an entire wing. I cut out the wheel wells following the dimensions given and using the plastic wheel wells as a guide. I installed Hobbico retracts on the mounts, made up the pushrods, fit and glued the wheel wells into place and, last, epoxied the wing halves together.

I then cut out an opening in the center of the wing for the retract servo; you must use a low-profile retract servo. If you choose not to use retracts, you'll need to cut an opening in the wing panels for the hardwood gear mounts and then bolt the gear to the mounts and epoxy them to the wing. I made the servo mount using the supplied parts, fit the assembly into the wing and hooked up the pushrods. After making some final adjustments to the pushrods, the retracts were ready to go. I then mated the wing to the fuselage using

the supplied hardware. The fit was very good and needed no tweaking.

• **Engine.** Following the instructions, I mounted the motor mount on the firewall. There are horizontal and vertical centerlines on the firewall to ensure proper alignment, and they worked well. Next, I mounted an O.S. .46FX engine, added the throttle pushrod and plumbed and mounted the supplied fuel tank to the fuselage. I then fit and mounted the cowl on the fuselage.

I was a little disappointed that the supplied spinner was not blunt-nosed like the one pictured on the box top, but that can be easily modified.

• **Tail feathers.** Before you fit and epoxy the tail feathers to the fuselage, be sure to remove all film covering where the fin

### TAKEOFF AND LANDING

I powered the Messerschmitt with the O.S. .46FX that I used in my Spitfire, so the engine was already well broken in. It needed only minor adjustments on the low end for the inverted installation. Taxi tests revealed that the Bf109E had a tendency to nose over on a thick-grass runway, but paved runways would be no problem for this warbird. Careful use of elevator is needed until



flying speed is reached; the powerful O.S. .46 had the Messerschmitt up and airborne very quickly. When the landing gear retracted, I had a great-looking warbird! Landings were easy: just line the plane up with the centerline, reduce throttle and flare to a 3-point landing. The Messerschmitt lands very much like an advanced trainer would.

### LOW-SPEED PERFORMANCE

The Messerschmitt handles quite well at slow speeds. Induced stalls showed no tendency to snap-roll, and with a little power, the Messerschmitt gets flying again very quickly. Control authority at low speed is solid.

### HIGH-SPEED PERFORMANCE AND AEROBATICS

At full throttle, the Messerschmitt really scoots along! Strafing runs down the runway that turn into victory rolls are great fun! Scale-type aerobatics are easy to perform and really look the part; loops and rolls of any size or speed are also simple. Inverted flight required a fair amount of down-elevator, but other non-scale maneuvers require little effort. Using the recommended throw, control feel was right on the money. All in all, the Messerschmitt is an easy-to-fly, great-looking warbird!



joins the fuselage and where the stab joins the vertical fin. I epoxied the vertical fin into place first and then added the horizontal stab after the epoxy had cured.

After hinging the elevators, I cut out the pushrod exits in the fuselage and I assembled the elevator pushrods—a single dowel with two rods for each elevator half—with the kit-supplied materials.

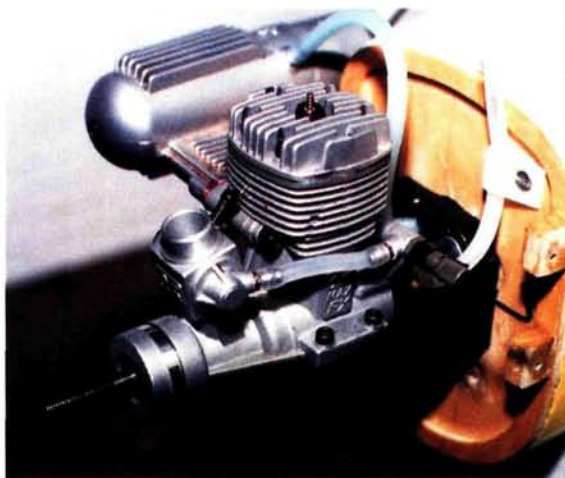
Because the fuselage is tapered in the rear and the pushrod bends outward, pushrod installation can be difficult. You can overcome this problem by using two pieces of outer Nyrod. From the rear, push the outer Nyrod through the pushrod exits in the fuselage until they reach the servo-tray area. From the front, slide the pushrods into the outer Nyrod until the pushrods exit the fuselage. When you remove the outer Nyrods, the pushrods will be properly positioned.

At that point, I hinged the rudder, added the tailwheel assembly and completed the control-linkage installation for the elevators and the rudder.

The kit includes scale aluminum braces to brace the horizontal stab to the fuselage. It is important that you use them; they add a great deal of strength to the assembly. I drilled through the stab and secured the braces with 2-56 screws, washers and nuts.

#### FINAL ASSEMBLY

When the airframe was complete, I mounted the servos on the servo tray. Because I wanted to screw the servo tray into place, I attached two spruce strips



**Left: the O.S. .46FX engine provided plenty of power for scale maneuvers. Right: the scale aluminum braces add a great deal of strength to the assembly.**



to the fuselage. I placed the receiver battery directly behind the fuel tank and the receiver right behind the battery. I placed the servo tray where the instructions indicated.

I balanced the model prior to hooking up the pushrods to the servos, and corrections were not needed. (If corrections to the CG are necessary, the servo tray can be adjusted without adding any excess weight.) Finally, I hooked up the pushrods, checked for correct movement and ensured that there was no binding.

After trimming, fitting and painting the canopy, I set the control throws as recommended in the manual. The Messerschmitt was now ready for action.

#### CONCLUSION

The Kyosho Super Quality Series Messerschmitt Bf019E was a joy to build. Anyone who has built a few ARFs can make this warbird flight-ready in a single weekend. Waiting for the epoxy to cure is more time-consuming than any other stage of the assembly. All of the parts fit

perfectly, and the completed plane looks great on the ground and even better in the air. The Messerschmitt flies like a low-wing trainer and makes a great companion to the Spitfire. Need a warbird in a hurry? Look no further! ✦

**APC Props;** distributed by Landing Products, 1222 Harter Ave., Woodland, CA 95776; (530) 661-0399; fax (530) 666-6661; [www.apcprop.com](http://www.apcprop.com).

**Cool Power;** distributed by Morgan Fuels, a division of Morgan Inc., P.O. Box 1201, Enterprise, AL 36631; (205) 347-3525; fax (205) 393-4852.

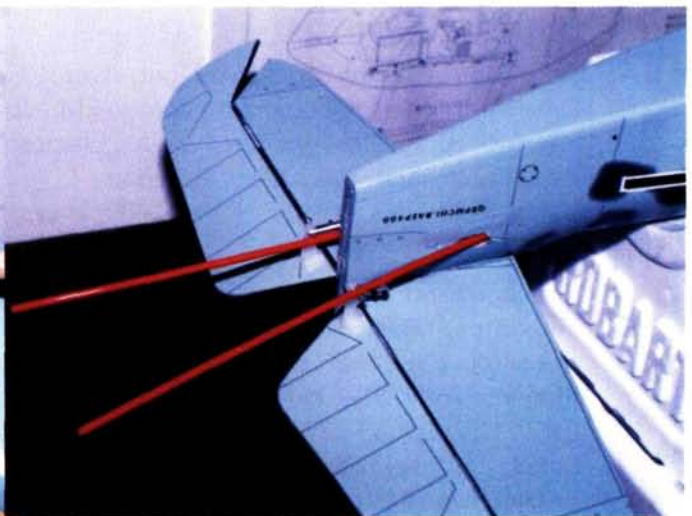
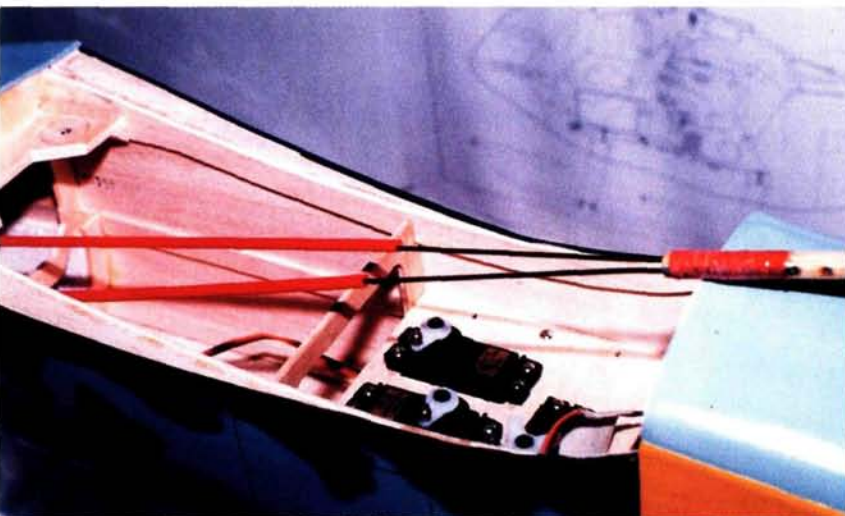
**Great Planes Model Distributors Co.,** P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; fax (217) 398-0008; [www.greatplanes.com](http://www.greatplanes.com).

**Hobbico;** distributed by Great Planes Model Distributors Co.

**JR;** distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 355-9511; [www.horizonhobby.com](http://www.horizonhobby.com).

**Kyosho;** distributed by Great Planes Model Distributors Co.; [www.kyosho.com](http://www.kyosho.com).

**O.S.;** distributed by Great Planes Model Distributors Co.



**Left: the pushrod installation can be made less difficult by pushing two outer Nyrods through the pushrod exits in the fuselage and into the servo-tray area. Right: after threading the pushrod through, remove the outer Nyrods, and the pushrods will be in place.**





*Easy-build  
classic aerobat*

# Herr Engineering Pitts Special

by Randy Randolph

**O**ver the years, Herr Engineering has earned a reputation for building strong, solid aircraft using precise laser-cutting technology. With the introduction of its new sport-scale 1/2A Pitts Special, Herr continues this tradition.

Like its Herr siblings, the Pitts is constructed of high-quality, laser-cut balsa parts that fit perfectly to produce an airplane that is absolutely straight and true in all respects. This, plus the tab-and-notch construction method, ensures that the Pitts can be quickly assembled with minimum effort; you'll be at the flying field in no time.

The Herr Pitts Special also comes with a molded cowl and wheel pants, prebent landing gear, a top-quality hardware package, a computer-drawn plan and a complete instruction manual (this

includes a list of the materials and tools you'll need).

## CONSTRUCTION

According to the manual, you should first write the part numbers on all of the laser-cut parts. This is important and will save you a lot of time later. From that step on, I followed the manual exactly; I assembled the tailpieces first and followed this by assembling the fuselage and wings. The tail sections require little more than sanding, but there is some work to be done before you start the

## SPECIFICATIONS

**MODEL:** Pitts Special

**MANUFACTURER:** Herr Engineering

**DISTRIBUTOR:** Sig Mfg.

**TYPE:** sport biplane

**WINGSPAN:** 30 in.

**LENGTH:** 27 in.

**WING AREA:** 300 sq. in.

**WEIGHT:** 27 oz.

**WING LOADING:** 13 oz./sq. ft.

**ENGINE REQ'D:** .074 to .15ci

**ENGINE USED:** Norvel .074

**RADIO REQ'D:** 4-channel w/four miniservos

**RADIO USED:** FMA Direct Fortress receiver w/four Futaba S-33 servos

**LIST PRICE:** \$99.95

**FEATURES:** the kit includes a hardware package, prebent landing-gear legs and a molded cowl and wheel pants; laser-cut parts; step-by-step instruction manual; computer-drawn plan.

**COMMENTS:** the Pitts Special goes together so easily that you can be at the flying field in no time. It is a well-made, solid aircraft.

## HITS

- Well-thought-out and executed design.
- Good step-by-step instruction manual.
- Excellent laser-cut parts and parts that fit together well.
- Good hardware package and trim sheets.

## MISSSES

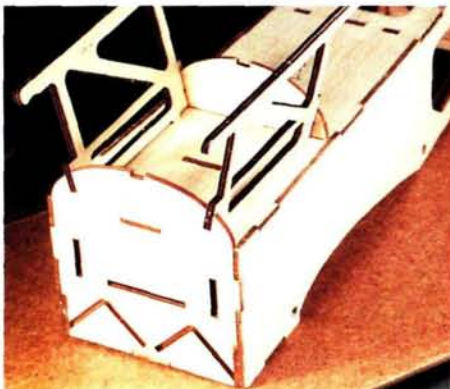
- Slight deviations from scale in the cabane area.





fuselage: some of the bulkheads require doublers, the cabane struts have to be sanded, and the leading edges (LE) and trailing edges (TE) must be rounded and smoothed. This is easy when the parts are in your hand, but it would be really tough once they have been installed in the fuselage.

Once you have



*The fuselage sides, forward turtle deck, cabane struts and firewall fit perfectly together like a jigsaw puzzle. The M-shaped grooves in the bottom of the firewall are the landing-gear mounts.*



finished the preliminaries, assemble the fuselage sides to make the basic box structure using formers, two laser-cut parts, a top deck and a bottom sheet. The finished product is a straight and true fuselage.

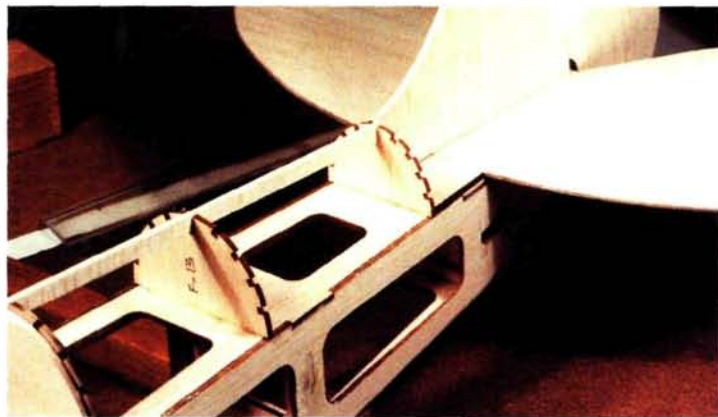
• **Fuselage.** The sheeting around the plywood cabane struts (which are easily mounted) requires some measuring and fitting. This is not difficult, but it does call for care. Most of the work is in the aft part of the

into the stringers aft of the cockpit. This is a rather simple carving job but one that takes a little extra time.

I used my band saw to roughly shape the tail fairing blocks. After I had glued them to the fuselage as instructed, I tack-glued scrap 1/8-inch balsa in place of the stab and fin. That made shaping with an 80-grit sanding block a snap. The fuselage probably took a couple of hours to complete, including cleanup.

fuselage, which is made of soft balsa blocks that fit over the stab on either side of the fin. These must be carved and sanded smoothly to shape so they fair

• **Wing.** The top wing has no dihedral, and building it flat over the plan is about as smooth an assembly as you can hope for. The only difficult parts are the forward top and bottom sheeting. Because the center of the wing is square and both panels are swept back, it takes trial and error to fit the sheeting in that area. The bottom wing



*Above: the aft turtle-deck floor and the fuselage sides click together and guarantee a straight fuselage. The formers support balsa stringers that flesh out the aft turtle deck. Left: soft balsa blocks fair the stab and rudder into the fuselage. I used a sanding block partially wrapped with sandpaper to blend them into the aft turtle deck.*

doesn't have any tricky spots because it does not sweep back. It does have dihedral, but the center sheeting is fairly easy to add. Once that is complete, there are a few more balsa blocks to carve and sand on each of the wingtips and some general sanding to do, but when you've finished, you'll have a pair of really nice wings. The interplane struts fit into the wings nicely and smoothly.

I removed the interplane struts for all of the test flights. With the recommended Norvel .074 installed, the Pitts is easy to fly, but I do not recommend that you attempt to fly it with a smaller engine.

#### TAKEOFF AND LANDING

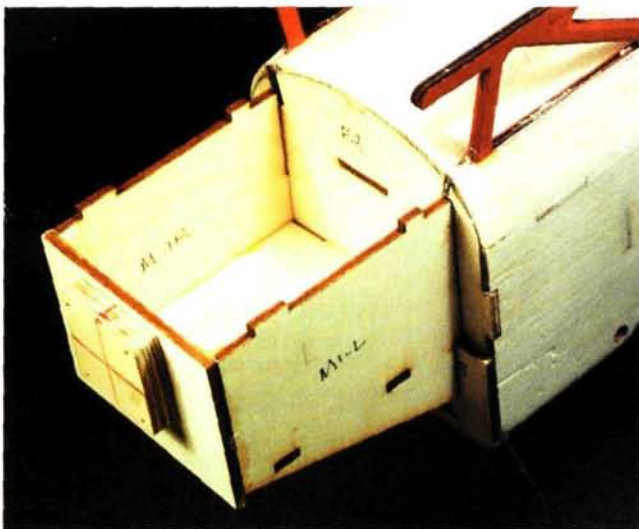
Takeoff is more graceful than quick, and the Pitts does require some rudder to keep it going straight down the runway. In the air, control response is smooth, and it takes very little time to become comfortable with the airplane. Landings are smooth but are best when you carry some power down to the ground.

#### GENERAL CHARACTERISTICS

The aerobatics are what you would expect from a Pitts Special. Loops, rolls, stall turns and spins are possible, but there is no real vertical performance with the .074 engine. Slow flight is not really slow because some speed is necessary to maintain good control. This is a clean airplane, and deadstick landings are not difficult; just keep some speed down to the runway and smooth it on.







The 1/4-inch-plywood tank and engine mounts are epoxied onto the firewall. When the tank is installed, the top is sheeted with 1/4-inch sheet balsa. Notice the 1/4-inch-plywood spacer I added to move the engine farther forward in the cowl.

#### • Landing gear and engine mount.

According to the manual, the next step is to install the landing gear and build the engine/tank mount on the front of the firewall. The landing gear fits inside a ply sandwich on each side of the firewall and is a very secure mount. The engine/tank mount builds like a box with an open top. It should be built as a subassembly before you attach it to the firewall. Install the fuel tank inside the box, then route the throttle line through the mount and into the cockpit area. Once fuel lines are connected, glue the top into place to complete the assembly. This is a slick way to move the tank away from the electronic parts yet make it accessible.

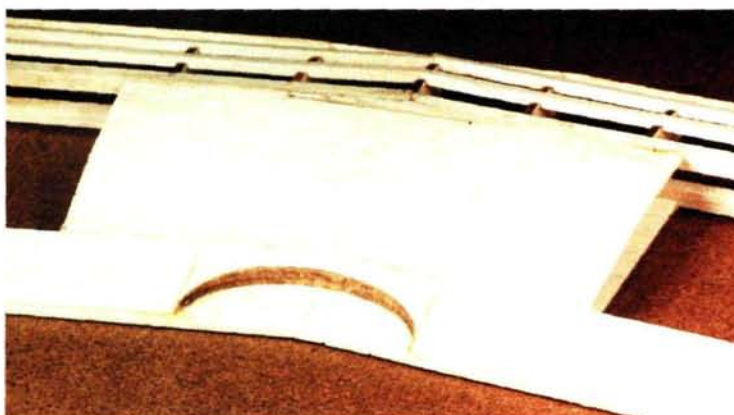
Next, I painted the mount and firewall with epoxy to fuelproof everything inside the cowl. I then covered the airplane with deep red MonoKote.

• **Engine installation.** When I test-fit the cowl over the engine, I realized that I needed a little more clearance at the front of it. To achieve this, I epoxied a piece of 1/4-inch plywood to the firewall; it was roughly the same size as the back of the engine mount. The additional 1/4 inch not only provided more clearance, but it also made it easier to fit the cowl over the Norvel .074 engine I used. I then secured the engine mount to the firewall with machine screws drilled into holes that I had hardened with thin CA.

• **Cowl and wheel pants.** I've always dreaded assembling three-part plastic cowls, but I was surprised to find that my concern was

not justified with the Pitts. I used a straightedge razor to cut out the areas that had to be joined with each other. With the exception of several places where the glue ran out of the joints, there weren't any problems; the extra glue was easily sanded away. The wheel pants should be assembled in the same way as the cowl pieces.

I reinforced the areas where the cowl and wheel pants are mounted with scrap plastic and then



Once the bottom sheeting is in place, the cutout over the cockpit in the top wing TE is finished and sanded. The laser-cut part that forms the cutout certainly simplifies this job.

painted them to match the covering. I mounted the wheels according to the instructions, but I used the tiller method to mount the tailwheel instead of directly connecting it to the rudder.

• **Radio installation.** I used an FMA Direct Fortress receiver with four Futaba S-33 servos, and they took up very little room in the area provided. I then installed a 600mAh battery pack just behind the firewall to achieve the proper balance. I wound the antenna around a soda straw; this makes the antenna easier to insert into the aft part of the fuselage. A shortened antenna does somewhat reduce the receiver's effective range, but this is a small airplane, and it is difficult to see when it's more than a couple of hundred yards away. I made the rudder and elevator pushrods out of 1/4-inch-square balsa instead of wire.

#### FIRST FLIGHTS

After a radio range check, I ran and peaked the engine without the cowl. Then I checked the radio again, refueled, added the cowl and proceeded to the runway. I had

installed the rudder servo with servo tape, and on the way to the runway, it gave way. As a result, my initial flights were more of a series of ground loops with a free-floating rudder! My servo tape was too old, I guess, and it just wouldn't stay put, so I put off test flights until I fixed the problem by using plywood mounts and screws for all the servos. This was, however, a very good test for the landing gear, which took the indignity in stride.

Subsequent hand-launches resulted in slow turns and dives to the left. I eventually decided that there must also be a warp in the top wing that caused the left-turn problem, and the small control throws spelled out on the plan were not enough to overcome the warp. A heat gun and a little muscle straightened out the warp, which was really quite small. I also moved the control horns and the servo arms outward, and that almost doubled the control throws. This time, the airplane took off and flew just as it was supposed to fly—very well!

I tested the structural integrity of this airplane on the initial flights, and it proved to be extremely durable and solid. I installed the Norvel .074 engine recommended by Herr, but the Pitts would probably fly even better with a .10, which would give it that friskiness expected of a Pitts. In fact, this plane is so well made that it would probably be able to withstand the stress that even a .15 would inflict on its airframe. Just don't lose it in the air; it is small! ✈

**FMA Direct**, 9607 Dr. Perry Rd., Unit 109, Ijamsville, MD 21754; (800) 343-2934; fax (301) 831-8987; [www.fmadirect.com](http://www.fmadirect.com).

**Futaba Corp. of America**; distributed by Great Planes Model Distributors Co., P.O. Box 9021, Champaign, IL 61826; [www.futaba-rc.com](http://www.futaba-rc.com).

**Herr Engineering Corp.**; a division of Sig Mfg., P.O. Box 520, Montezuma, IA 50171; (800) 247-5008; fax (641) 623-3922; [www.sigmg.com](http://www.sigmg.com).

**Norvel**, P.O. Box 3459, San Luis Obispo, CA 93403-3459; (800) 665-9575; (805) 547-8360; fax (805) 547-8365; [www.norvel.com](http://www.norvel.com).

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# Lanier RC Edge 540T

by Gerry Yarrish

**D**esigned for sport aerobatic and IMAC competition, the Lanier 1.20 Edge 540T is part of the company's 21st Century line of almost-ready-to-fly (ARF) models. The model can be built quickly and, if powered adequately, the Edge is capable of advanced 3D aerobatics. I have built a number of Lanier kits and have always enjoyed the way they go together. Lanier's new ARF takes much of the work out of the process, and once assembled, it flies as well as any kit-built plane.



## IN THE BOX

When you open the box, it is obvious that someone spent a lot of time putting the model parts together. The fuselage is made with laser-cut wood parts, and the foam wing panels plug neatly into place. The 540T has a painted fiberglass cowl and wheel pants, and all of the hardware—wheels, axles, control horns, hinges, fuel tank and a pull/pull rudder control system—is part of the package. The easy-to-follow instruction booklet is typical of all Lanier kits and is well illustrated. Once trimmed, the clear canopy





## SPECIFICATIONS

**MODEL:** Edge 540T

**MANUFACTURER:** Lanier RC

**TYPE:** aerobatic ARF

**WINGSPAN:** 73 in.

**LENGTH:** 66 in.

**WING AREA:** 1,008 sq. in.

**WEIGHT:** 11 lb.

**WING LOADING:** 25.14 oz./sq. ft.

**ENGINE RANGE:** .90 to 1.20 2-stroke or  
1.20 to 1.82 4-stroke

**ENGINE USED:** Saito 150 GK

**FUEL USED:** 15% Powermaster

**RADIO REQ'D:** 4-channel (throttle, rudder,  
elevator and aileron); 2 aileron servos  
required

**RADIO USED:** JR 10X

**PROP USED:** Master Airscrew 16x8

**PRICE:** \$349.95

**FEATURES:** the Edge 540T comes with the fuselage, wing panels, horizontal stabilizer halves and all control surfaces completely built and covered with iron-on film. The kit includes instructions, decals, fiberglass engine cowl and wheel pants, formed plastic canopy, aluminum landing gear, wheels, fuel tank and all hardware to complete the model. A rudder pull/pull control system is also included. The kit has both plug-in wing panels and horizontal stabilizer halves.

**COMMENTS:** the 1.20 Edge 540T is a great sport aerobatic that can be set up to perform 3D maneuvers. Field setup is quick and easy, and the model requires only a few hours to assemble.

### HITS

- Good flight performance.
- Easy airplane to land.
- Excellent access to interior.

### MISSSES

- Wire channels in wing cut in wrong place.
- Had to replace some hardware.

## A 1.20-size unlimited ARF aerobat

fits nicely and the formed aluminum landing gear is more than strong enough for a model of this size.

The model comes nicely covered with film, and a stick-on Mylar decal set is also included. The nicest feature of the kit, however, is the plug-in horizontal control surfaces. As with the wings, the stabilizer has an aluminum carry-through tube to support it. Simply remove a few screws, and the tail feathers come right off; this is very convenient if you want to store or transport the model.

The large main fuselage hatch extends

from the firewall all the way back to the aft edge of the canopy. With the hatch removed, you have complete access to the model's interior. The servo tray is laser cut, and I found that all the internal glue joints were sound.

### ASSEMBLY

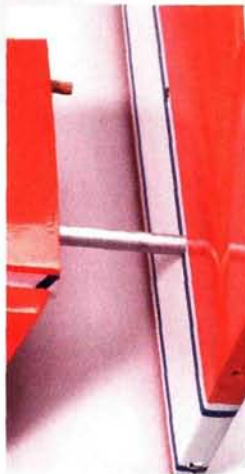
The kit is very complete; everything you need to assemble the model is included. You can install your engine inverted or horizontally, as I did with my Saito. The area behind the firewall is open, and this makes installing the fuel tanks and engine





**The Lanier RC Edge 540T ARF is a very complete package. Note that the tail surfaces have symmetrical airfoil cross-sections.**

**Below: as with the Edge's wing panels, its stabilizer halves plug into place and have an aluminum tube for support.**



mount very easy. Once the engine and fuel system are installed, there are two lite-ply cover plates to close this section of the fuselage. I glued the bottom plate into place, and I used screws to secure the top one. This way, I can still get to things if they need maintenance later.

A laser-cut opening in one of the forward formers precisely fits around the fuel tank. The tank slips easily into place, and its neck fits into a hole cut in the firewall. I used Hobby Lobby PFM adhesive to hold the tank in place. Most of the work around the engine compartment involves cutting the openings in the fiberglass cowl to fit the engine's head and muffler. When I cut into

the cowl, I found that the paint peeled away from the fiberglass. I called Lanier, who quickly mailed a replacement cowl. A simple fix for peeling paint is to carefully apply some thin CA to the edges and allow it to dry.

To make room for my Pitts-style muffler, I cut away a portion of the firewall to clear the exhaust pipes. Once all the engine work was done, I removed the engine and the hardware and

then gave the firewall and fuel-tank compartment a coat of thinned epoxy resin to fuelproof the surfaces. To make engine starting more convenient and safe, I used a Du-Bro remote glow-plug igniter and attached it to the top of the firewall.

The aluminum landing gear is very easy to install; the attachment point inside the model is reinforced with aluminum angle stock. The fiberglass wheel pants are easy to install and require you to drill a hole and install a blind nut so you can attach the gear to the main gear with a 4-40 screw. Though the kit comes with axles, I used Du-Bro bolt-on axles that were a little longer; this gave me more room to adjust the wheels' positions within the wheel pants. The included tailwheel assembly needed to be bent slightly so that its tiller arm wouldn't interfere with the bottom of the rudder.

The wings are very easy to install and require you to glue in the hinges, install the ailerons and then install the aileron servos and control linkage. To secure the panels in place, you have to drill and tap a hole into each end of the carry-through tube so you can thread a 4-40 bolt into place. For

The Edge 540T is an aerobatic hot dog, and with the proper engine and control throws, it can do every trick in the book—including wild 3D maneuvers. I powered my model with a Saito 150 GK 4-stroke engine turning a 16x8 Master Airscrew composite prop and burning 15-percent-nitro Powermaster fuel. I set the control throws as follows: rudder low rate—1½ inches left and right, high rate—2 inches left and right; elevator low rate—1 inch up and down, high rate—1½ inches up and down; aileron low rate—½ inch up and down, high rate—¾ inch up and down. The CG location was set at 4½ inches back from the wing's leading edge measured right next to the fuselage sides.

#### TAKEOFF AND LANDING

The Edge tracks extremely well on the ground and requires almost no rudder correction to maintain a straight ground run. The tail comes up immediately with the application of power, and the plane stays on the ground until you give it slight up-elevator. Once airborne, the climb rate is brisk and rock steady.

Landings are a breeze, as the model has a very predictable sink rate and it penetrates extremely well. I set up the landing by pulling throttle back to ½ directly across from myself on the downwind leg. I bring the throttle to ¼ on the base leg and then on final, I hold the throttle just above idle until directly over the end of the runway. So far, I have only wheel-landed the model, and it remains fully controllable all the way until the tail comes down. There is almost no need for rudder correction during the rollout (without a crosswind, that is).

#### GENERAL FLIGHT CHARACTERISTICS

All the controls are solid, and the model is very responsive to the slightest control input. The fuselage is long, and this gives the Edge the feel of a pattern ship in yaw and pitch response. Roll rate is also brisk but very proportional to the stick movement. When you move the stick, the model rolls immediately; when you center the stick, it stops. To match my relaxed flying style, I set up the

controls (on low rate) with about 40 percent exponential on ailerons and 50 percent on elevator. On high rates, all the controls are set at 30 percent expo. This gives me a smooth, controlled feeling throughout the flight without the model feeling twitchy or over-controlled.

#### AEROBATICS

One of the nice things about the Edge is how smooth and predictable it is at all throttle settings and flight attitudes. The model

tracks extremely well and has no tendencies to snap out of any maneuver as long as you have sufficient airspeed. Loops can be very tight or big and graceful, but a bit of rudder correction is helpful in maintaining straight vertical lines. Inverted flight is effortless, and very little elevator correction is needed to maintain altitude. Knife-edge flight is also extremely easy to execute; no roll- or pitch-coupling is evident when you apply rudder. On high rates, snaps are very positive, and I like to perform the maneuver while leading slightly with the elevator input.

If you want to try IMAC competition or just want a really hot Sunday flyer that won't give you white knuckles every time you land, the Edge 540T is a great choice.







**For power, I used the Saito 150 GK 4-stroke engine. You do have to supply your own engine mount. Install your engine so its horizontal centerline is 3¼ inches up from the bottom of the firewall. Right: with the main hatch removed, there is total access to the radio gear and fuel tank.**



convenience, I leave the tube secured in one panel and then, when I get to the field, I slide it through the fuselage and also slide the other panel into place. I screw in one bolt, and I'm ready to go. In my wing panels, the factory-cut wire channel in the foam-

core was in the wrong place; it did not lead to the servo cutout area. To fix this, I took a length of ⅝-inch-diameter brass tube and glued a dowel into it to act as a long handle. I sharpened the end of the tube and "drilled" through the foam to create a new channel. Lanier has corrected this problem.

The elevator uses two servos (one for each side), and they are installed in the tail just in front of and below the horizontal stabilizer's leading edge.

Short lengths of 4-40 pushrods connect the servos to the elevator halves. The rudder servo is under the main hatch next to the receiver, and the pull/pull cables are attached directly to the servo's output arm. The throttle

linkage is a simple length of ⅛-inch wire bent to shape and attached at both ends with E-Z connectors.

It took me only about 6 hours to assemble the Edge. Though the model comes with good-quality stick-on decals, I wanted my

model to be a little different, so I cut my own vinyl graphics with a Stika machine.

All things considered, the Lanier Edge 540T is an easy-to-build aerobat that's a blast to fly. You can dial it in to perform exactly as you prefer; from wild 3D action to easy sport aerobatics, the Edge can do it all. ✈

**Du-Bro Products**, P.O. Box 815, Wauconda, IL 60084; (800) 848-9411; fax (847) 526-1604; [www.dubro.com](http://www.dubro.com).

**Hobby Lobby Intl.**, 5614 Franklin Pike Cir., Brentwood, TN 37027; (615) 373-1444; fax (615) 377-6948; [www.hobby-lobby.com](http://www.hobby-lobby.com).

**Horizon Hobby Distributors**, 4105 Fieldstone Rd., Champaign, IL 61822; (877) 504-0233; [www.horizonhobby.com](http://www.horizonhobby.com).

**JR**; distributed by Horizon Hobby.

**Lanier RC**, P.O. Box 458, Oakwood, GA 30566; (770) 532-6401; fax (770) 532-2163; [www.lanierrc.com](http://www.lanierrc.com).

**Master Airscrew**; distributed by Windsor Propeller Co., P.O. Box 250, Rancho Cordova, CA 95741; (916) 631-8385; fax (916) 631-8386; [www.masterairscrew.com](http://www.masterairscrew.com).

**Saito**; distributed by Horizon Hobby.

**Stika**; distributed by Sky Aviation, 1 Transborder Dr., Champlain, NY 12919; (514) 449-0142.

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# The World Models Miss America

*A .40-size ARF beauty queen*



by Craig Trachten

**N**o facet of motorsports comes close to the speed and excitement of unlimited-class air racing—the chorus of Rolls Royce Merlin engines at full song, planes speeding to the next pylon with mere inches separating their wingtips, etc. Though few of us will ever experience such drama from the pilot's seat, The World Models Mfg. Co. Ltd. makes it possible to do more than just dream about it. Its Miss America version of the P-51 Mustang allows you to live the dream, albeit in 1:6.6 scale. In typical The World Models fashion, the Miss America ARF is first-class all the way through. Almost all of the assembly has been completed for you, and the quality is excellent. With a .40-size engine, its speed and aerobatic performance are very true to scale, and it really looks the part of a Reno Racer.

#### THE KIT

When I opened the box, I just had to paw through all the parts. I was very impressed with the construction and covering, and I was downright amazed at the level of detail that went into the design. The Miss

America is built up of balsa and ply and has a red, white and blue Oracover covering scheme. The quality is great, though the blue is a shade too light when compared with that on the full-size plane. The fiberglass cowl comes painted, and its installa-

tion is a real timesaver! The cowl is usually my least favorite part of any assembly. Getting it to fit correctly is a tedious series of cowl on, measure, cowl off, cut, cowl on, etc. The Miss America's cowl, however, comes with a transparent dummy cowl that makes cutting engine holes a cinch. The canopy frame and pilot figure are also painted. The retracts deserve special mention: not only are they included, but they are also installed. The icing on the cake is that all of the control surfaces come preglued. This adds up to one of the easiest, fastest-to-build ARF models I've ever come across. On the downside, reviewing it is difficult. What do you write about when most of the construction has been done for you?





## SPECIFICATIONS

**MODEL:** Miss America P-51 Mustang

**MANUFACTURER:** The World Models  
Mfg. Co. Ltd.

**TYPE:** sport scale

**LENGTH:** 49.6 in.

**WINGSPAN:** 57.5 in.

**WING AREA:** 585 sq. in.

**WEIGHT:** 6.21 lb.

**WING LOADING:** 24.45 oz./sq. ft.

**ENGINE REQ'D:** .40 to .46 2-stroke or .60  
to .70 4-stroke

**ENGINE USED:** MDS .48 2-stroke

**PROP:** APC 11x6

**RADIO REQ'D:** 5-channel w/6 servos  
(throttle, rudder, elevator, retracts,  
2 aileron)

**RADIO USED:** Futaba 8UAPS

**FUEL:** Wildcat 15% 2- and 4-cycle with  
18% lubricant

**STREET PRICE:** \$189.99

**FEATURES:** built-up balsa-and-ply  
construction with Oracover multicolored  
covering; factory-installed retracts and  
control surfaces; painted pilot figure and  
canopy frame; painted fiberglass cowl  
with transparent dummy cowl.

**COMMENTS:** buy it, build it, fly it and  
enjoy it. With the Miss America's high  
quality, completeness, easy assembly  
and great flying characteristics, it doesn't  
get much better than this.

### HITS

- Lots of extras included.
- All the tough assembly has been done  
for you.
- Dummy cowl.
- Factory installed retracts.

### MISSES

- None.

### ASSEMBLY

The World's manual is very well-illustrated, but it is definitely short on written instructions; in fact, other than a few basic descriptions ("balsa wood," "up position," etc.), no directions are printed. Don't worry though; they are not really necessary because the construction drawings are clear.

• **Wings.** Start the wing assembly by attaching the main wheels and the landing-gear covers. Next, join the wing halves. I wrapped a piece of 3/4-inch masking tape around the root prior to assembly to keep epoxy ooze off the covering. Epoxy the roots and wing joiner together. The fronts of the root plates act as the front wing-mounting pins. I used a small clamp to hold the

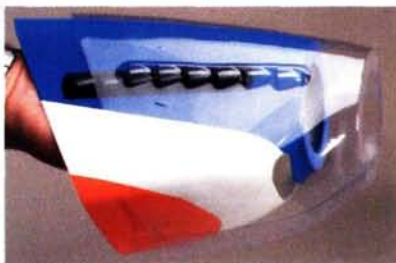


PHOTOS BY WALTER SIDAS





**Above:** The World Models Miss America is about as complete as an ARF can get. Of particular interest are the repainted cowl, pilot and canopy. **Right:** cowl installation can be a tedious process, but it isn't that way with the Miss America. The dummy cowl template, with cutout markings, means getting a perfect fit is a one-step process.



leading edges together while the epoxy cured. A healthy piece of masking tape held the trailing edge in position. While the glue cured, I propped up each wingtip to maintain alignment until the joint was completely dry.

Next, install your retract servo. Follow the drawings that show the pushrod bends. I started my setup in the wheels-down position; this helped me avoid binding and rod

setup in this way because in the past, I have smoked a servo by powering up with a bad setup. When I am confident of my setup, I leave the arm off the servo. I attach it later, when my radio gear is installed, and I'm able to make sure the servo is in the neutral position. (Again, I've learned the need to do this the hard way.)

The aileron servos can now be mounted on the cover plates. This is an easy, clean

crossover. I manually rotated the servo arm 180 degrees to check the rod throws. No; I did not twist the servo! I removed the arm, rotated it and then reattached it to the servo output shaft. I check my

way to mount them: epoxy mounting blocks to the plates and screw the servos to the blocks; the servo arm is exposed through a slot in the cover plate, so all you see is a thin slot instead of the servo faceplate. Once the servo plates have been attached to the wing, install the aileron control rods.

• **Tail.** Attaching the empennage couldn't be easier. The horizontal stabilizer slides into the rear of the fuselage. It has four contact points with the fuselage that make a strong bond. I applied epoxy to the two bottom contact points, and then I slid the stabilizer into place, checked for alignment and set the assembly aside to dry. The vertical stab is held in place by the upper two horizontal-stabilizer contact points, so I poured in epoxy, set the vertical stab in place and ended up with an extremely strong tail section with all three components epoxied to one another.

The tailwheel assembly is held in place by two screws. Insert the steerable arm into the rudder; the unit is one piece with the tailwheel wire factory-bent. For strength, a metal U-plate surrounds the entry point in the rudder.

## THE DAGO RED OPTION

by Chris Chianelli

The World Models offers a Dago Red kit for \$199.99 that uses the same wing and tail group as the Miss America. The only difference between the two models is that the Dago incorporates a beautifully crafted fiberglass fuselage that accurately captures the scale outline of the highly modified full-size Reno Racer.

If you look between the tank and the receiver foam, you'll see the internal stringer structure of the Dago's fiberglass fuselage.



Just look at that striking Dago Red presence. The standard kit comes with a plastic spinner, but for only 15 bucks more, you can order the kit with the precision-turned and polished-aluminum spinner you see here.

Except for its superior thrust response at low speeds owing to the 4-stroke powerplant, the Dago's flying characteristics are identical to the Miss America's—excellent!



To maintain that sleek Dago Red profile, the Saito .72 was side mounted. This modification presented no problems at all. With an APC 12x10 prop mounted on the Saito and with the gear retracted, this model is fast—very fast.





When I set up the P-51 at the field, it drew a lot of comments from the modelers present. I ran through a couple of tanks of fuel, cycled the landing gear and did a radio range check. When all was in order, we were ready to go!

### TAKEOFF AND LANDING

The Mustang handles well during taxiing and doesn't show any tendency to nose over. To taxi in a crosswind, I needed to hold rudder to keep the Mustang on line, as it does tend to weathervane. The take-off roll is surprisingly short; the Mustang literally leapt into the air. For the next take-off, after the tail came up, I held some down-elevator so the plane would build up sufficient airspeed. After a couple of passes around the field, I raised the landing gear and made minor trim corrections. The plane is very clean, and when you reduce power, it takes a little longer to slow than most planes. For the first few flights, start your approach farther out until you get a feel for slowing the plane down. With practice, you'll find the proper throttle setting to maintain during approach. The Mustang makes good wheel landings, and it's easy to hold the tail up until most of the speed has been bled off.



### LOW-SPEED PERFORMANCE

At low speeds, control authority is good, but the ailerons do get soft. During stall tests, the plane would get to a high angle of attack before falling off easily to either side. Just adding power got the Mustang flying very quickly, and I didn't notice any snapping tendencies.

### HIGH-SPEED PERFORMANCE

The P-51 handles very well at high speeds. Control response is positive to inputs without being twitchy. I found the recommended low rates very good for high-speed flight and the high rates good for landings. I didn't notice any instability in high-speed maneuvers, and trim changes weren't needed with the landing gear retracted.

### AEROBATICS

This model is smooth and highly aerobatic. The plane flies very "neutral" and will do all scale-type maneuvers with ease. The Miss America holds inverted with some down-elevator, and it's a lot of fun flying mock Reno Races.

—Rick Bell

• **Engine, fuel tank and cowl.** The Miss America comes with a 320cc fuel tank; assemble it as you normally do. I make all of mine three-line tanks, and to make de-fueling easy, the third line is clunked just like the pick-up line.

The supplied engine mount is an adjustable 4-piece unit. Don't forget thread-lock; use the blue (serviceable) variety. The last thing you want is for your engine to vibrate loose, and under a cowl it is difficult to check regularly. Mount your engine of choice (I used an MDS Pro .48), and make sure the drive washer is 4.65 inches in front of the firewall. If it's shorter, the back of the spinner will scrape the cowl.

Next comes the cowl. As I mentioned earlier, the dummy cowl makes this easy. I cut just to the outside of the marks, and the cowl fit like a glove. I then marked and drilled holes for the needle-valve and low-mixture screw.

• **Finishing touches.** Installing the pushrods and servos is a no-brainer. The pushrod chases are factory installed; you only have to slide the rods through them



**A sleek Reno Racer like this wouldn't look right in the air without retracts, a fact not lost on The World Models—retracts come installed in the Miss America.**



**Another timesaver is the control-surface hinges; they're preinstalled and glued. All you have to do is install the horizontal stabilizer and connect the control rods.**

and screw on the clevises. Attach your servos to the radio tray and the horns to the control surfaces, and you are good to go.

This kit is so complete that even a pilot bust is supplied. And it's painted! "The canopy?" you ask. The frame is factory painted. I glued the pilot into place with CA gel, and I attached the canopy the following day so it

wouldn't fog with CA fumes. I attached it to the fuselage with four screws.

Attach the wing to the fuselage with the two wing bolts. The front of the finishing bottom plate has two pins that slide into the bulkhead and then screw in at the rear to the bottom of the fuse. Check the CG and control-surface throws, and you'll be ready to go flying.

### CONCLUSION

The World Models got it right with the Miss America! It produced a top-quality kit with lots of extras, factory installed almost every-

thing and sells it at a price so low that you might think someone made a mistake on the price tag. The plane flies like a model of a Reno Racer should, and its spectacular scale color scheme draws crowds at the field. What more can I say? Go out and buy one; build it and enjoy!

For more information, visit the website at [www.missa.com](http://www.missa.com) to get a great dose of history on the P-51D Mustang and the full-scale Miss America Reno Racer. ✚

**APC Props;** distributed by Landing Products, 1222 Harter Ave., Woodland, CA 95776; (530) 661-0399; fax (530) 666-6661; [www.apcprop.com](http://www.apcprop.com).

**Futaba Corp. of America;** distributed by Great Planes Model Distributors Co., P.O. Box 9021, Champaign, IL 61826; (800) 682-8948; fax (217) 398-0008; [www.futaba-rc.com](http://www.futaba-rc.com).

**MDS Engines;** distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 355-9511; [www.horizonhobby.com](http://www.horizonhobby.com).

**The World Models Mfg. Co. Ltd.;** distributed in the USA by AirBorne Models, 2127-H S. Vasco Rd, Livermore, CA 94550; (925) 371-0922; [www.theworldmodels.com](http://www.theworldmodels.com); [www.airborne-models.com](http://www.airborne-models.com).

**Wildcat Fuels,** 3005 Park Central, Unit T, Nicholasville, KY 40356; (606) 885-5619; [www.wildcatfuel.com](http://www.wildcatfuel.com).



# Cermark New Timer

*Classic old-time charm with  
modern convenience*

## SPECIFICATIONS

**MODEL:** New Timer

**MANUFACTURER:** Cermark

**TYPE:** old-timer ARF

**WINGSPAN:** 56 in.

**WING AREA:** 338 sq. in.

**WING LOADING:** 17 oz./sq. ft.

**LENGTH:** 34 in.

**MOTOR:** Cermark 480 motor  
w/Cermark SC-20 speed control  
(Included)

**PROP:** Master Aircrow 7x3 (included)

**RADIO REQ'D:** 3-channel w/2 servos

**RADIO USED:** Futaba T6XA transmitter and Hitec Micro 555 receiver w/2 Cermark servos

**BATTERY USED:** Cermark 7-cell, 800mAh NiMH

**DURATION:** 14 min.

**PRICE:** \$159.95 (basic); \$189.95 (bronze); \$219.95 (silver); \$324.95 (gold)

**FEATURES:** gelcoated, fiberglass fuselage; built-up balsa wings and tail feathers; Ultracote covering; Speed 480 motor, servos and pushrods installed; included aluminum spinner and prop.

**COMMENTS:** the New Timer is a great new entry into the electric old-timer category. It's a forgiving plane that's perfect for relaxed flying. The compact size means that it's easy to transport and leaves no mess to clean up. Leave it in your car for a lunchtime excursion at any medium-size field.

### HITS

- Good craftsmanship and easy assembly.
- Cooling slots molded into fuselage.
- Easy radio and equipment access.
- Good flight capabilities.

### MISSES

- Decals curled at edges after several flights.



**T**he Cermark New Timer is Jesse Chao's new and improved version of his own 50-year-old, award-winning design. It incorporates materials that were not available when the plane was originally flown; these include a high-quality fiberglass fuselage and balsa wing and tail construction, as well as electric power. The use of see-through Ultracote covering is reminiscent of the beautiful silk and dope free-flight airplanes of the '40s and '50s.

by Bob Van Tassel

The plane is available in a variety of colors and kit combinations, so you're virtually guaranteed to find the perfect New Timer for you. The basic package includes the model with the motor and pushrods already installed. It also includes a Windsor prop and an aluminum spinner. In the bronze package, the rudder and elevator servos are also installed. The silver package, which is the one I reviewed, includes all of the above plus an SC-20 electronic speed control and a complete hardware package. The gold package includes everything in the three aforementioned packages plus a Hitec Focus 3 radio, an 800mAh NiMH battery and a charger.

As I looked over the kit—and I use the word “kit” loosely—I realized that there was virtually no assembly left to be completed. I looked for wrinkles in the covering to use my heat gun on, but I could not find any. Per the instructions, I checked to make sure the hinges on the elevator were secure, and they were. Next, I carefully inspected the fuselage for sharp edges that could cut through the rubber bands needed to hold the wing in place; there were none. I also found the motor screws and servo compartment to be secure.

#### ASSEMBLY

Following the instructions, I inspected the wheel collars and then secured the landing gear to the fuselage with the three provided screws. The remainder of the assembly process is extremely basic.

**The New Timer comes in four versions: basic, bronze, silver and gold. The silver package comes with everything you see here.**



PHOTOS BY WALTER SIDAS





I had an opportunity to fly the New Timer many times before writing this article, and I enjoyed every flight. The first flight was on a beautiful day with only a slight breeze. I charged up the batteries and headed to the field.



#### TAKEOFF AND LANDING

Because the field I use is covered with grass, I chose to hand-launch the New Timer. I expect that, on a hard surface, the model will easily take off from the ground. With the motor running full, I could feel the plane pulling, so I took about two steps forward, held the plane over my head and released it. Unlike some electric models I have flown that tended to settle before climbing, the New Timer flew straight out for about 10 feet while it picked up cruising speed and started a steady

climb. Landing is simply a matter of judging the glide, lining up with the runway, keeping your fingers off the sticks and doing nothing. It lands itself.

#### LOW-SPEED PERFORMANCE

The New Timer's slow-speed performance is outstanding, but what would you expect of a free-flight design? This plane is not built for aerobatics by any stretch of the imagination; however, you can loop it by diving to get up speed.

#### HIGH-SPEED PERFORMANCE

This plane is not designed to perform at high speeds, but on low passes, it was impressive and responsive.

#### GENERAL FLIGHT

At about 75 feet up, I fed in some rudder and was very surprised by how responsive it was. As you might expect, I had to use a little up-elevator in turns, but the New Timer was at about 400 feet in no time at all. I proceeded to fly the plane with trim tabs, and when the motor was running, I used some down-trim to avoid too steep a climb. With the motor off, I fed in a little up-trim to "shallow out" the descent. This plane can cover an impressive amount of ground while thermal hunting with no power. Controls were responsive both with and without power. I averaged about three climbs of about 400 feet on each charge. Without catching a thermal, my flights averaged about 14 minutes per charge.

• **Wings.** Join the two wing panels with a wooden dihedral brace. I used 5-minute epoxy on the dihedral brace and the two root ribs. The dihedral is set automatically.

• **Tail feathers.** After sanding the stab platform to remove the gloss finish, epoxy the stab to it. Be sure to attach the wings to the fuselage with the supplied rubber bands, and check to make sure that the assembly is square before the epoxy dries. Last, insert the fin tab into the slot on the stab and epoxy it into place.

• **Radio equipment.** In the silver version, most of the radio equipment comes already installed. It is accessed through a panel on the side of the fuselage, and the cover is attached to the fuselage via a tab on its front. The rear is held in place with hook-and-loop fastener. Cermark supplies a selection of quick connectors for those who do not like to solder. A small switch that arms the motor and flight controls is mounted just in front of the pylon. I used a Hitec micro receiver, which I mounted on the inside top of the fuselage with hook-and-loop fastener. The antenna wire exits the fuselage through one of the cooling slots.

#### FINISHING TOUCHES

Last, I applied the pressure-sensitive graphics supplied by Cermark and prepared to balance the plane. (The graphics supplied with my plane had curled after a few flights.) Set the control throws as indicated.

With the batteries on board, the plane should be balanced at  $1\frac{1}{8}$  inches back from the wing's leading edge.

All told, it took me only a little more than 2 hours to complete the New Timer, but I probably could have done it faster. It's extremely easy to assemble and looks great when finished. In fact, it would make a great trainer.

The New Timer covers a lot of ground looking for a thermal, and when you catch one, it will rise to the occasion. You could even pull up a chair while your New Timer flies. Enjoy a relaxing day at the field while you reminisce about a bygone era. If it

sounds as if I liked the plane, I did! I think you'll like it, too. ✈

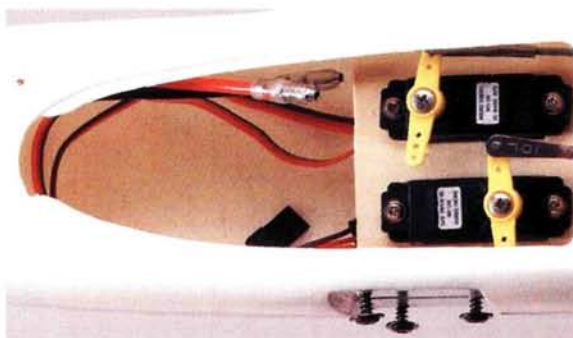
*Cermark Electronics, 107 Edward Ave., Fullerton, CA 92833; (714) 680-5888; fax (714) 680-5880; www.cermark.com.*

*Futaba Corp. of America; distributed by Great Planes Model Distributors Co., P.O. Box 9021, Champaign, IL 61826; (800) 682-8948; fax (217) 398-0008; www.futaba-rc.com.*

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*Master Aircrew; distributed by Windsor Propeller Co., P.O. Box 250, Rancho Cordova, CA 95741; (916) 631-8385; fax (916) 631-8386; www.masteraircrew.com.*

*Ultracote; distributed by Carl Goldberg Models, 4734 W. Chicago Ave., Chicago, IL 60651; (773) 626-9550; www.goldbergmodels.com.*



**Above:** most of the radio equipment was already installed in the New Timer. Note the unique access to the radio box via a side panel in the fuselage. **Right:** the motor comes already installed in the New Timer's fuselage. I double-checked the motor screws to be sure they were tight, and of course, they were.





# IMAC Aerobatics

## Cross-box maneuvers

by Dan Wolanski



Cross-box maneuvers are designed to allow an aerobatic aircraft to travel perpendicular to the original flight path to correct for wind drift during competition. These maneuvers are essential in full-scale International Aerobatic Club (IAC) competition, since the pilots do not use wind correction as we do in International Miniature Aerobatic Club (IMAC) competition. Since IMAC rules permit wind correction, there is arguably no reason to use cross-box maneuvers. IMAC does, however, allow these maneuvers because we try to emulate full-scale competition, and it also gives the pilot a chance to use the entire aerobatic box to fly his sequence. Most competition maneuvers can be converted to cross-box maneuvers by executing a  $\frac{1}{4}$  or  $\frac{3}{4}$  roll during the up- or down-line portion of the maneuver. For example, take the Hammerhead; a standard Hammerhead flown at the end of the box can be flown as shown in Figure 1. Now add a  $\frac{1}{4}$  roll in the down line, and the model will exit perpendicular to the flight path (see Figure 2).

The same can be said for a simple "Humpty Bump." Adding the  $\frac{1}{4}$  roll on the way up (up line) can allow you to adjust the diameter of the top radius while flying in the cross-box direction. The  $\frac{1}{4}$  roll on the way down allows you to exit parallel to

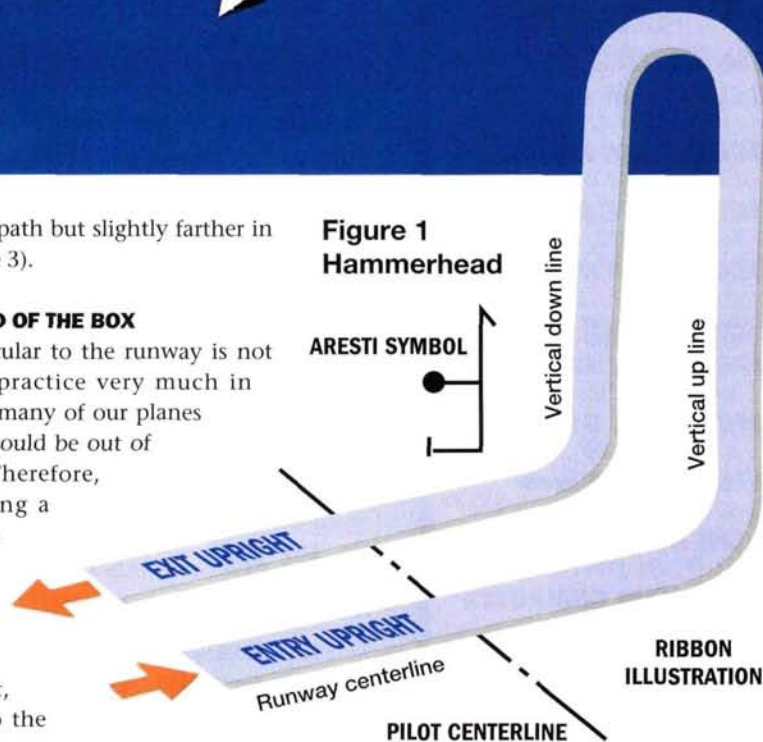
the initial flight path but slightly farther in or out (see Figure 3).

### END OF THE BOX

Flying perpendicular to the runway is not something we practice very much in IMAC. After all, many of our planes travel fast and would be out of sight quickly. Therefore, while attempting a cross-box maneuver, it may be very difficult to tell if you are, in fact, perpendicular to the runway. During cross-box maneuvers, most pilots look at too much of the wing during the rolling elements. What usually happens is that as the pilot attempts to fly perpendicular to the flightline, the plane actually heads toward the center of the box (slightly toward the pilot). The problem shows up after the cross-box maneuver, when the pilot attempts to pull into a vertical line and notices that the plane is not heading straight upward but is actually leaning in toward the center of the box.

To help correct this tendency, start by flying the cross-box maneuver directly in

Figure 1  
Hammerhead



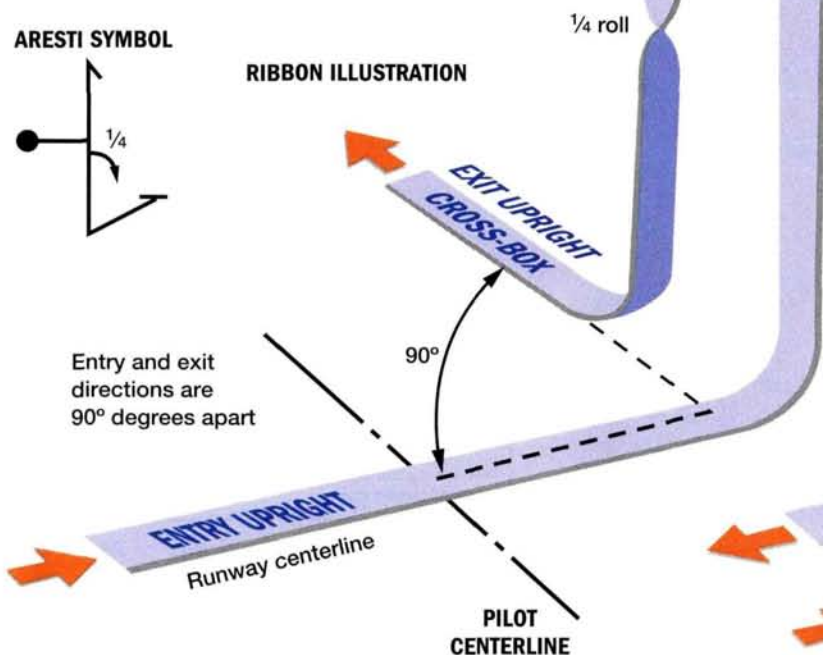
front of you. Try to exit straight and level while heading your plane directly away from you. After you've done this, slowly move the maneuver (a little bit at a time) away from your centerline and to the end of the box. After you've done the maneuver about 10 times, the model should be in its proper location and you will have a better picture in your mind's eye of how it should appear at the end of the box.

### THE NEXT LEVEL

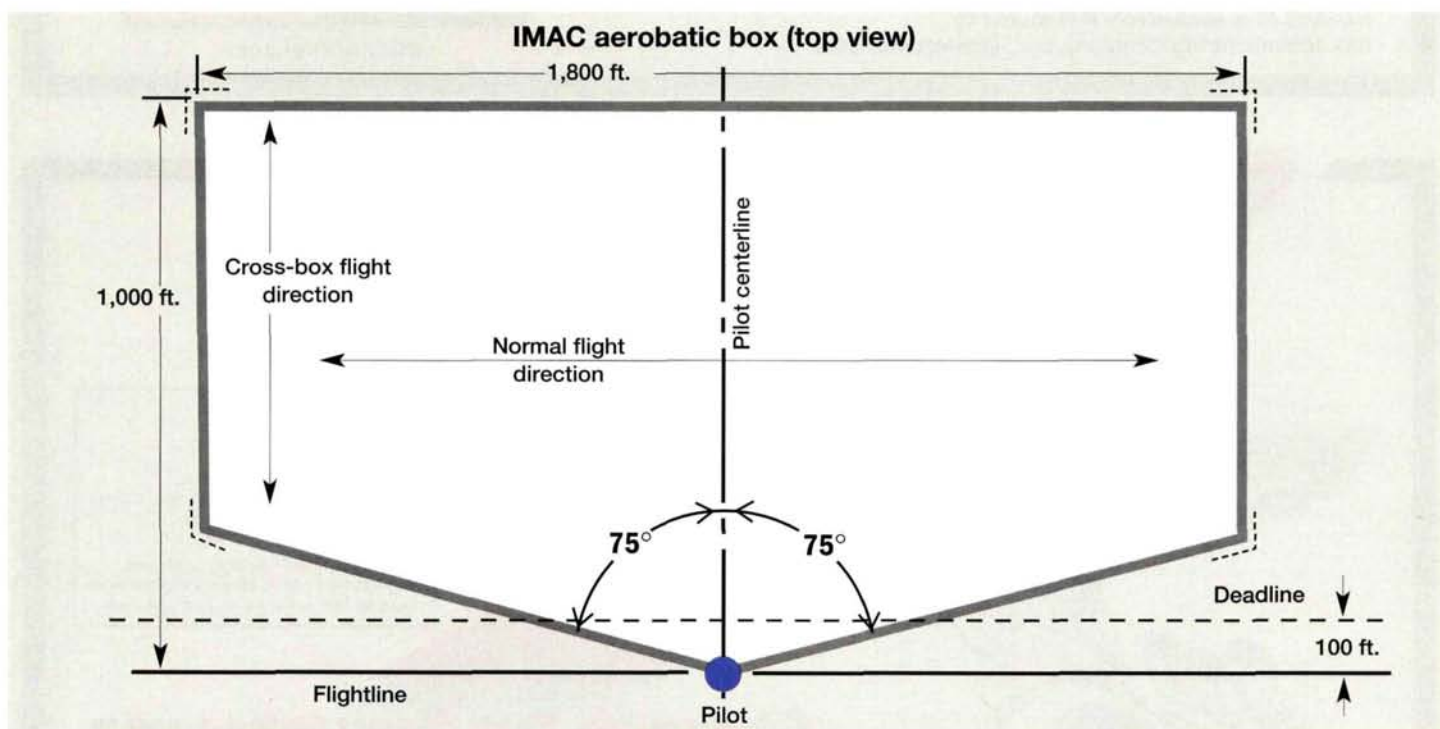
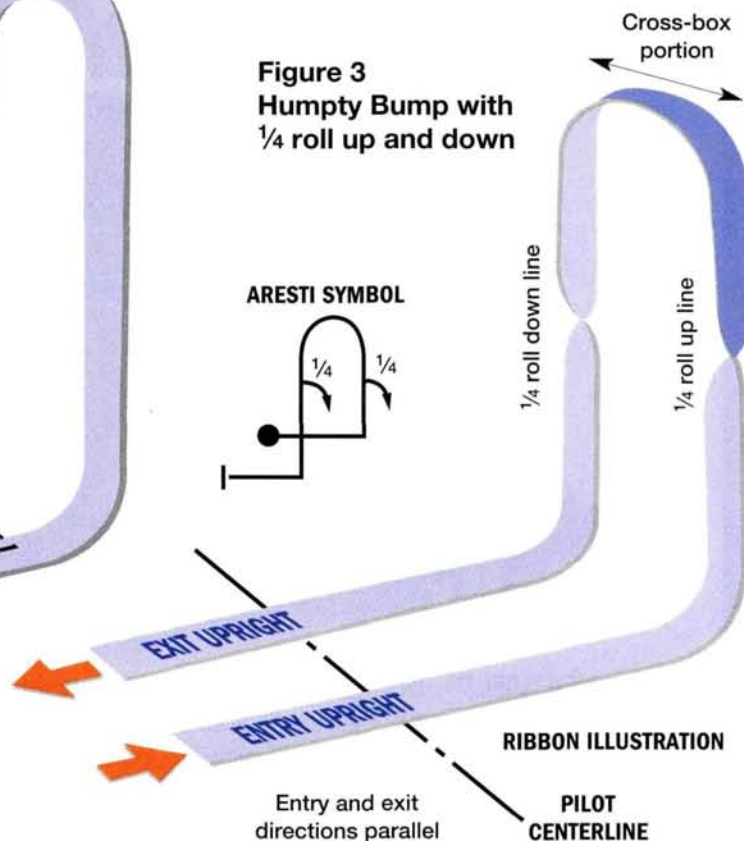
Once you have a better understanding of how perpendicular flight should look, it's



**Figure 2**  
Hammerhead with  $\frac{1}{4}$  roll down



**Figure 3**  
Humpty Bump with  $\frac{1}{4}$  roll up and down



time to take it to the next level. Instead of doing a simple  $\frac{1}{4}$  roll during the Hammerhead maneuver, change it to a  $\frac{3}{4}$  roll on the down line and exit cross-box inverted (depicted by dashed lines in the figures). Inverted cross-box maneuvers begin to appear in Advanced IMAC sequences.

Now perform another maneuver in the back corner of the box and exit it coming straight back in; this will give you a better

idea of what your plane looks like going out (and coming back in) at 90 degrees to the flightline. Once you are comfortable with one side of the box, start practicing on the other side. Remember: if your plane constantly leans in toward the center of the box, your inboard wingtip is too low or, more than likely, you are not traveling perpendicular to the runway.

Once you become comfortable with both sides of the box, begin experiment-

ing with different maneuvers. Try flying maneuvers such as a Figure-8, a Tail Slide and a Shark's Tooth. Maneuvers such as  $\frac{1}{4}$  and  $\frac{3}{4}$  rolling circles can be entered and exited from the cross-box position. Once you get the hang of it, the sky's the limit for possible flight combinations that will allow you to use the entire aerobatic box. ✦









# Curtiss Wright Technical Institute Bunting I

*One-of-a-kind  
Golden Age racer*

by Henry Haffke



**T**he Curtiss Wright Technical Institute (CWTI) Bunting I is a little-known aircraft that was designed by Al Novotney and built by the faculty and students of the Institute to fly in the 1935 National Air Races. The Bunting I was test-flown by well-known pilot Tex Rankin, and it attained 105mph on its first flight. When I saw the 3-views of this little gem it really got my attention, and I thought this would be a neat model for the annual Rhinebeck Jamboree. It seemed that it would be a relatively simple model to build, and at  $\frac{1}{4}$  scale, it would result in a 72-inch-span model that I felt sure would fly well on a .40- to .50-size engine. If you are as interested in this little airplane as I was, let's start building.





## SPECIFICATIONS

**MODEL:** Bunting I

**MODEL TYPE:** Semi-scale sport model

**WINGSPAN:** 72 in.

**WING AREA:** 720 sq. in.

**LENGTH:** 51 in.

**WEIGHT:** 6 to 7 lb.

**WING LOADING:** 20.8 oz./sq. ft.

**ENGINE REQ'D:** .40 to .50 2-stroke

**ENGINE USED:** K&B .40 2-stroke

**PROP USED:** Top Flite 11x4

**RADIO REQ'D:** 4-channel w/5 servos (ailerons, elevator, rudder)

**RADIO USED:** Hitec Focus 4

**FUEL USED:** Cool Power 10% nitro

**COMMENTS:** the Bunting is an easy-to-build and easy-to-fly 1/4-scale model of a little-known plane from the 1930s. Thanks to its low wing loading and flat-bottom airfoil, the balsa and ply model flies well. The Bunting I has great visual appeal and will be the center of attention at any club field.



## FUSELAGE

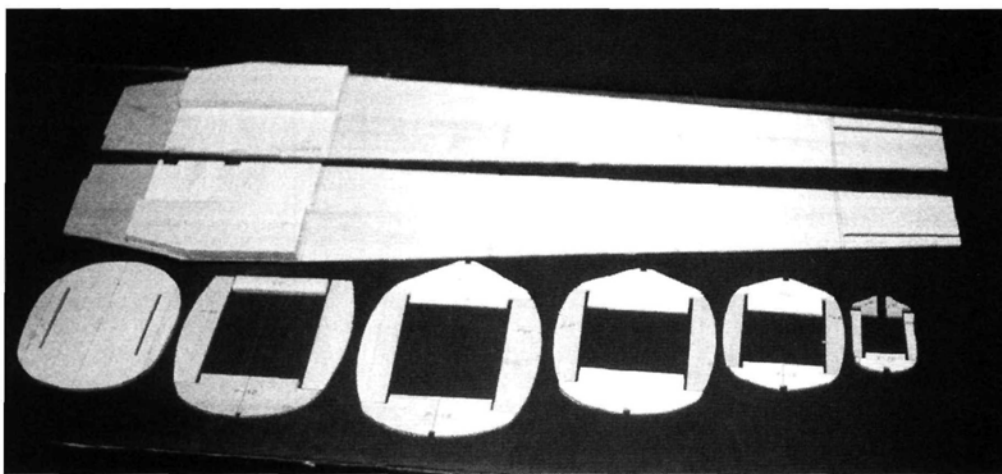
Start by cutting fuselage bulkheads 3, 4, 5, 6 and 7 from 1/8-inch balsa sheet, and former F2 and the engine-mount box from 1/8-inch plywood. Cut the firewall from 3/16-inch plywood and then drill all the necessary holes for the engine mount, throttle linkage and fuel lines. I used a K&B .40 2-stroke and set up the firewall accordingly.

Build the engine-mount box and make sure it fits in F2. Cut the fuselage sides from 1/8-inch balsa and mark the bulkhead positions; note the splice under the wing saddle. Cut the 1/8-inch

plywood doublers and glue them to the outside of each fuselage side and add the 1/2-inch wing saddle doublers.

When the glue has dried, place F2 forward side down on wax paper on a flat surface; glue the fuselage sides into the slots making sure they stay square while the glue sets. Make the tail post from 1/2x1/8-inch balsa and glue it between the ends of the fuselage sides, making sure each side is the same length. Now glue the fuselage bulkheads, maple landing-gear blocks and plywood skid mount into place. Next are the top and bottom stringers followed by the rest of the stringers.





**The fuselage sides, doublers and bulkheads are ready for assembly. Note that the doublers are glued to the outside of the fuselage.**

Form the  $\frac{1}{8}$ -inch-diameter main and rear landing-gear legs, and attach them to the landing-gear blocks with nylon straps and screws. Bind the legs together with fine copper wire, and solder it, making sure that the legs are at the angle shown on the plan. Glue the  $\frac{1}{8}$ -inch plywood wing-strut mounts against bulkheads F3 and F4. Now plank the front bottom of the fuselage between F2 and F4 with  $\frac{1}{8}$ -inch balsa strips. Start from the fuselage sides and work toward the center (you'll have to taper the forward end of each strip). When you've finished, carve the fuselage and sand it to a smooth finish.

Add the two  $\frac{3}{32}$ -inch-diameter center landing-gear wires; use rubber bands for the bungee cords. The leg fairings are made from  $\frac{1}{8}$ -inch balsa sandwiched between the legs and with  $\frac{1}{16}$ -inch plywood caps on both sides. Use  $\frac{1}{8}$ -inch balsa strips in front of and behind the wire legs, then sand the fairing into a streamlined shape. Build the wheel pants from laminated balsa, then carve and sand them to shape. Don't forget to cut out the notch in the wheel pants (WF-1) for the landing-

gear leg. Note the  $\frac{1}{4}$ -inch plywood insert on the inside of each pant. The rest of the fuselage will be completed later.

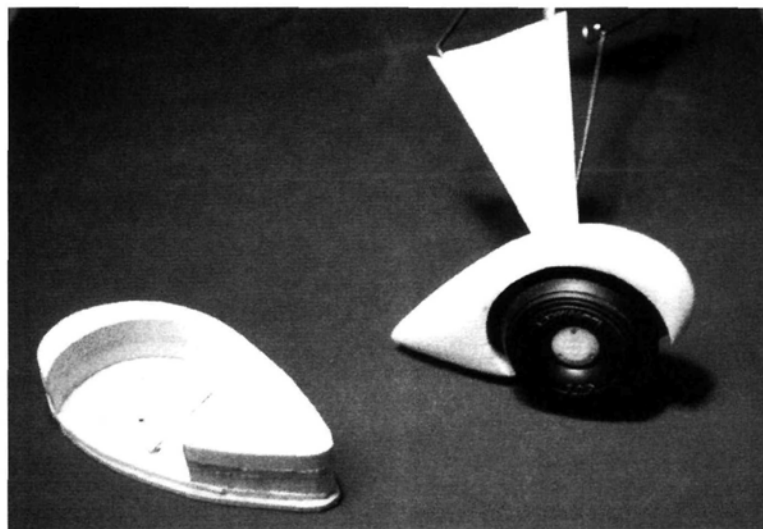
#### TAIL

The tail surfaces are built on the plan from  $\frac{1}{4}$ -inch-square and  $\frac{1}{4}$ -inch-thick balsa sheet. Start with the stabilizer, and make the trailing edge (TE) out of one piece of wood. Build the elevators and join them with  $\frac{1}{4}$ -inch-square spruce. Next, build the fin and rudder, round the edges of the tail surfaces and sand them to final shape. Install the hinges, but do not glue them until later; fit the tail surfaces on the fuselage.

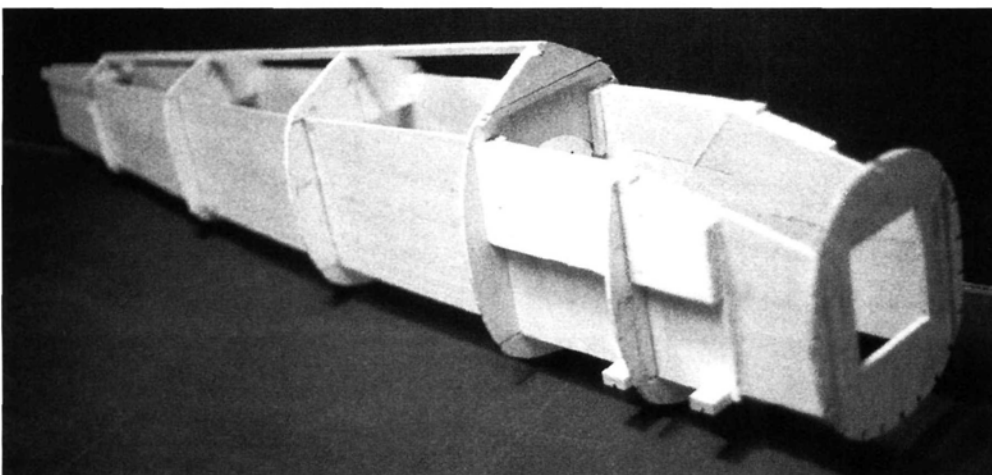
#### WING

The wing doesn't have dihedral and is easy to build. First, make the two spars of  $\frac{3}{16}$  plywood 48 inches long. If you can't find the correct length of wood, 36 inches will do. Mark their centers and laminate the  $\frac{1}{4}$ -inch hard balsa to the plywood spars with their top edges flush with each other. This will make a  $\frac{1}{16}$ -inch lip on the bottom of the spar for the leading-edge (LE) sheeting. Cut the ribs out of  $\frac{1}{8}$ -inch balsa, pin the spars into place, and then add the ribs, LE and TE. Fill the area between the LE, main spar and rib 1A with soft balsa blocks. Build the TE in the same way; you'll later carve it to a gull shape.

Add the  $\frac{1}{2}$ -inch soft balsa wingtip and tip ribs. Sheet the LE with  $\frac{1}{16}$ -inch-thick balsa sheet, build the ailerons and the aileron servo mounts, and sand the wing and ailerons to their final shapes. Glue the  $\frac{1}{8}$ -inch plywood cockpit opening to the spars and ribs at the wing center section.



**The landing-gear fairing on the left is ready to be final-shaped. Note the plywood insert used to mount the fairing on the wire leg with straps. The fairing on the right is finished and mounted. I used Cub-style wheels.**



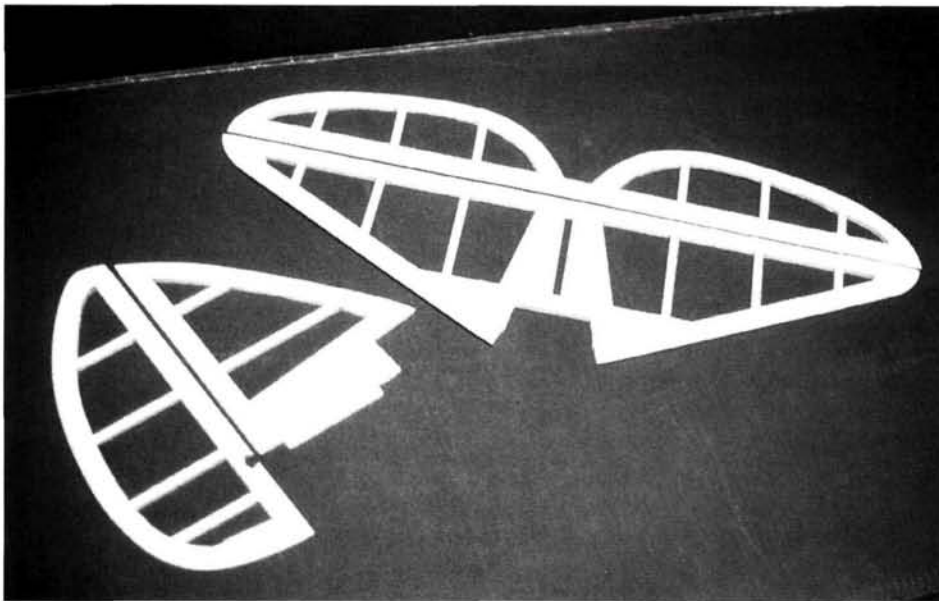
**The fuselage is framed and ready for the stringers and landing gear.**

The wing struts are made of  $\frac{1}{2} \times \frac{1}{4}$ -inch spruce that has been carved and sanded to a streamlined shape. Epoxy a bent wire into the lower end of the strut, and plug it into a hole drilled in the fuselage strut mount. Make the upper strut brackets from aluminum, and epoxy them to the upper end of the struts. They are screwed into the plate in the wing panels.

#### ENGINE COWL ASSEMBLY

Fit the engine-mount box, positioning it so that the propeller will line up as shown on the plan. When correct, epoxy it to F2, using a square to keep everything straight.

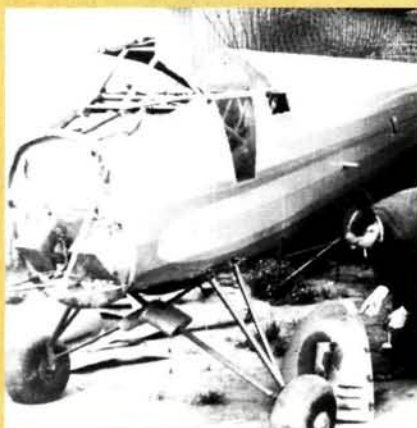




The tail surfaces are built of  $\frac{1}{4}$ -inch-square strips and sheet balsa. They are simple and rugged.

## BUNTING EARLY AVIATION HISTORY

With many new designs being built every day, the '30s were exciting times in aviation. The faculty and students of Curtiss Wright Technical Institute decided to enter the 1935 National Air Races, and they built a plane designed by Al Novotney. The fuselage was built of welded-steel tube and wooden formers and stringers and covered with fabric. The tail surfaces were also of welded-steel tube and fabric-covered, and the wings were of a wood construction and had solid spars. Powered by a borrowed 36hp engine from an Aeronca C3, the Bunting achieved 105mph on its first flight. Unfortunately, the fate of this pretty airplane is not known.



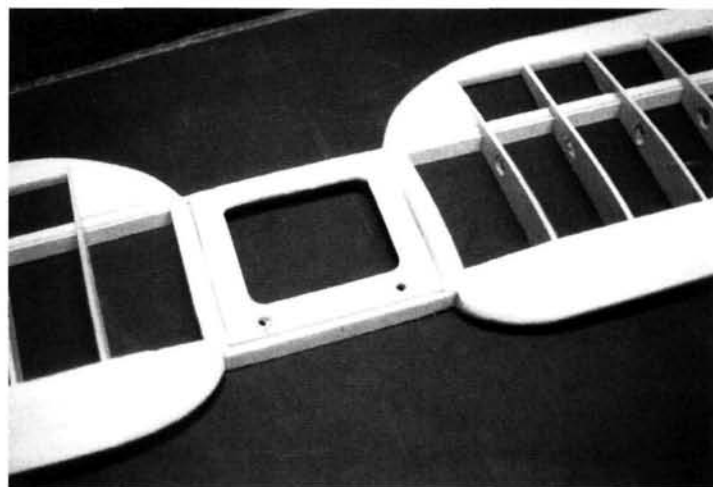
This mid-'30s photo is one of very few of the Bunting that exist.. In a rear corner of the Curtiss Institute sits the fuselage minus the engine, wings, cowl and wheel fairings. Note the balloon-type tires and bungee landing gear.

Fit a balsa block between F2 and the front wing spar, and glue two strips of  $\frac{1}{4}$ -inch square balsa between the fuselage sides to the bottom of the block. Roughly carve the block to shape. Fill in the rest of the open areas with  $\frac{1}{4} \times \frac{1}{2}$ -inch balsa blocks as noted on the plan, then carve and sand them to final shape. If desired, the top block can be a removable hatch that will allow access to the fuel tank.

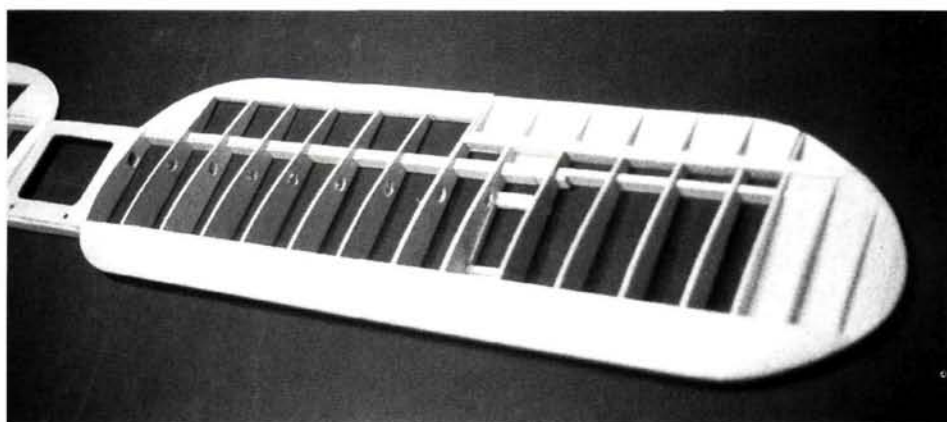
Remove the engine to build the cowl, which is built as top and bottom halves of  $\frac{1}{2}$ -inch blocks. On the thrust line from F2,

center and glue a  $\frac{1}{2} \times 1$ -inch basswood block on each side of the engine-mount box on which to mount the cowl halves. Start with the top half by layering  $\frac{1}{2}$ -inch blocks. As you work, you must glue small blocks to the inside of the area ahead of the engine box for the front end of the cowl. Cut clearance for the engine and then install it; be careful to remove only what is necessary to make it fit over the engine. Then roughly carve the cowl's outer shape. Build the bottom half of the cowl in the same way as the top half, but remember to allow clearance for the Pitts-style muffler.

The cowl halves are screwed to the basswood blocks from each side; for better support, space the screws as far apart as possible. Glue F1 to the front of the lower cowl, making sure the prop shaft is in the center. Remove  $\frac{1}{16}$  inch from the front of the top cowl half, glue F1A to it, and run two small, self-tapping screws through F1 into F1A. This will secure the cowl pieces to the engine box. Now carve and sand the cowl to its final shape. Add the lower scoop and the two cheek fairings to the

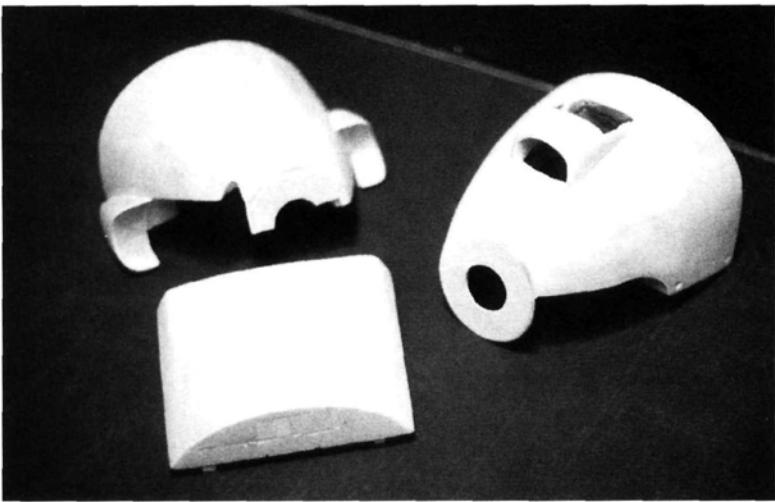


The wing center section is finished and the plywood cockpit opening has been made. See how the LE and TE blocks have been shaped to achieve the gull shape of the center section.



The completed wing panel with aileron and servo mount. Notice the holes in the ribs for the servo extensions.





The cowl halves are ready to be primed and painted. The halves are joined horizontally to allow easy access to the engine.

top half; if you want to, build the dummy cylinders (parts shown on plan). All that's left to finish the fuselage is to add the 1/16-inch balsa-sheet turtle deck. Before doing that, I suggest that you install your radio system.

COVERING AND FINISHING

After final sanding, I applied a coat of Balsarite to my model and covered it with Cub Yellow 21st Century fabric and orange fabric trim. I cut the registration and rudder numbers out of the same

material. The multicolored CWTI emblems on the sides of the aircraft are made of Coverite's trim sheet. No one knows which colors were used in the original emblem, so I used white, gold, silver, blue, red and black to good effect.

I painted the cowl and wheel fairings with

matching 21st Century orange and yellow paint and covered the landing-gear legs with fabric. The windshield frame is made of 1/16-inch plywood with clear plastic inserts.

WING MOUNTING

Make sure you mount the wing only after you've covered it. Epoxy the basswood wing-mounting blocks as shown on the plan. Fit the wing to the fuselage, and epoxy the 1/4-inch-square spruce rear wing lock into place; make sure you get a tight

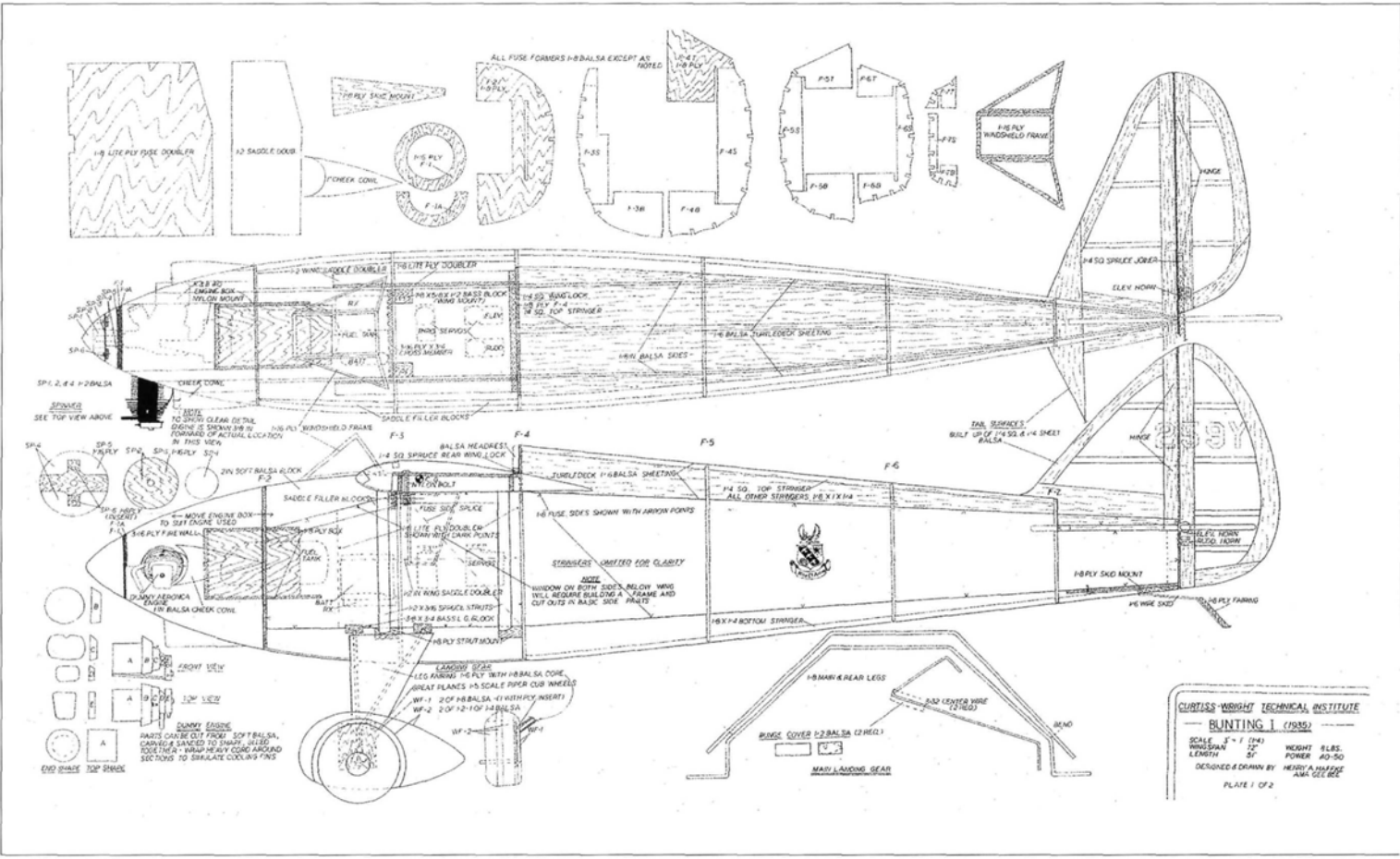
fit. Square the wing to the fuselage, then drill through the cockpit opening with a no. 7 drill bit into the maple mounting blocks and tap them with a 1/4-20 tap. Make the headrest pad out of balsa and glue it to F4.

AT THE FIELD

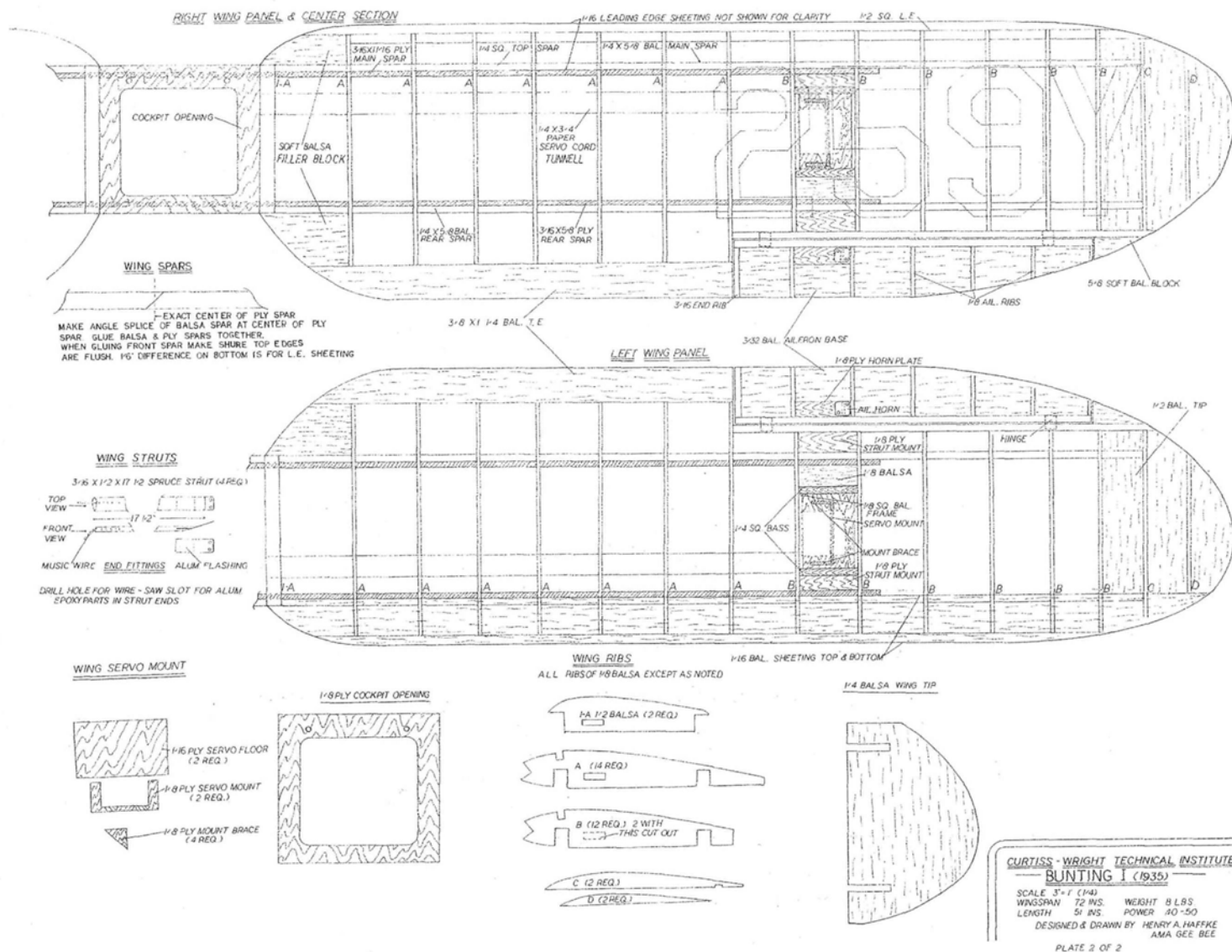
I asked Barry Yardley to be the test pilot, and he made the first flights early in the day. After a long run, the Bunting lifted off the ground nicely, and it had plenty of power in the air.

The first flight went well, but some left trim was needed. After landing, I could see the left wing panel had wash-in, and that created a tendency to turn right. After removing the wash-in, I flew the model on its second flight at reduced throttle and was comfortable with it. As expected, the rest of the flights went very nicely. I wanted the model to fly like the real one, and I feel this was accomplished with the .40 engine.

The aircraft is very clean and fast for its size, and it has a majestic presence. For a 1/4-scale airplane, it's very light and slows down nicely for landings. Like any tail-dragger, it need you to hold some up-elevator until it gets moving. Very little rudder is needed to keep it straight on takeoff, and it taxis well with the skid.







To order the full-size plan, turn to "RC Store.com" on page 146.



The almost complete airframe; the turtle deck behind the cockpit is ready to be sheeted.

The Bunting I is a very attractive, little-known aircraft from the '30s that's delightful in every respect. ✈

**21st Century**; distributed by Great Planes Model Distributors.

**Balsarite (by Coverite)**; distributed by Great Planes Model Distributors.

**Cool Power Fuel**; distributed by Horizon Hobby Inc., 4105 Fieldstone Rd. IL 61822; (217) 355-9511; fax (217) 352-0355; [www.horizonhobby.com](http://www.horizonhobby.com)

**Coverite**; distributed by Great Planes Model Distributors.

**Great Planes Model Distributors Co.**, P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; fax (217) 398-0008; [www.greatplanes.com](http://www.greatplanes.com).

**Hitec RCD Inc.**, Glenn Merritt, 12115 Paine St., Poway, CA 92064; (858) 748-6948; fax (858) 748-1767; [www.hitecrd.com](http://www.hitecrd.com).

**K&B Model Products Inc.**, P.O. Box 98, Sierra Madre, CA 91025; (626) 359-9527; fax (626) 301-0298; [www.modelengine.com](http://www.modelengine.com).

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## HOBBICO MicroPanel Plus Simplify your field box

It doesn't take too long for a modeler to reach the point at which he needs a power panel to simplify his field box electronics. A glow driver, an electric starter and an electric fuel pump are pretty much the norm, and without a panel, you can get the various power cords tangled up.

Hobbico's new MicroPanel Plus is very compact and simplified. Gone are the switches and the meter; in their place are just two LEDs. The panel supplies 12 volts for your starter or fuel pump and also acts as a power output for a glow plug. A charging receptacle for a Ni-Cd glow-starter battery is part of the panel, and the glow-plug heat system has an adjustable heat-control potentiometer and an LED power indicator.

I liked using the MicroPanel and installed it in a smaller field box that I use only for engine starting. If you are looking for a space-saving, inexpensive and easy-to-use power panel for your field box, or you want to make your own engine-starter box, the

Hobbico MicroPanel Plus is for you. Give it a try; great things do come in small packages. It sells for \$19.99.

**Hobbico**; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; fax (217) 398-0008; [www.greatplanes.com](http://www.greatplanes.com).

—Gerry Yarrish

## MODELSPORT VIDEO MAGAZINE Vol. 4, No. 3 Pages come to life

We've featured issues of *modelSPORT Video Magazine* in "Product Watch" before; we love to see the models in action and watch the how-to's done step by step right in front of the camera. The most recent edition features the exciting The World Models Mfg. Co. Zen 120 ARF—a graceful pattern ship that performs competition-level aerobatics for the camera. Its easy ARF assembly means you spend less time in the shop and more time in the air perfecting your flight routine.

Featured in the helicopter section is Thunder Tiger's awesome aerobatic Raptor 60 Ver. 2. For the park-flyer crowd, *modelSPORT* reviews one of our favorites, the GWS Tiger Moth. They run it through its paces and show you what you need to be successful with one of your own.

On the technical side, *modelSPORT* gives us an in-depth look at the big Saito FA-180—a favorite for unlimited-displacement competition. The video shows how to tear down this torque monster and then what to look out for when reassembling it. Also included is a useful section on salvaging crash-damaged servos; if you have a servo with trashed gears, you won't want to miss these tips. Pull/pull cables are a popular choice for positive control movement; this video shows you the best way to set them up.

A host of new products from Du-Bro, Sullivan, Castle Creations and others are featured, as well as a review of the Ikarus easyFly flight simulator. And finally, if you're into free-style aerobatics, don't miss the coverage of the Tropical R/C Fun-Fly event in Costa Rica. Quique Somenzini puts on a fabulous display of precision aerobatics set to music. He tops it off with a lesson on how to do knife-edge spins.

As always, the presentation is good, and the content is informative—especially the how to's. Seeing certain techniques being used helps you absorb the material. Give *modelSPORT Video Magazine* a try; you can pick up the latest issue at your local hobby shop, or visit [www.modelsport.com](http://www.modelsport.com) to order directly. Each issue runs approximately 2 hours and costs \$6.99 plus shipping. It's a great way to see the hobby in action right in your own home.

—Matt Boyd



continued on page 98



continued from page 92

## SPECIALTY PRESS

### Warbird Tech Series: F4U Corsair, B-24 Liberator and B-17 Flying Fortress

An in-depth look at three WW II classics



Whether you're researching your next scale project or just want to peruse photos and specs of warbirds from the "good old days," these three newly amended volumes in the Warbird Tech Series will be valued additions to your library. The books in this series have always been great sources of information, but these new editions have a revised format; additional color photos have bumped the page count up to 104, and everything is printed on a heavier, glossy page stock. One thing that hasn't been bumped up is the price; the books still sell for \$16.95.

Volume 1 covers the Consolidated B-24 Liberator and gives an insightful look into the design, development and deployment of this versatile bomber. Numerous variants of the B-24 are documented, as are the PB4Y-2 Navy version and several cargo and civilian models. There are lots of detailed photos and diagrams of the internal layout, including cockpits, turrets and control panels. Excerpts from technical manuals give plenty of specifications, and production figures and deployment charts will keep history buffs in the know.

At the other end of the spectrum is Volume 4 on the Vought F4U Corsair. This sleek fighter with its distinctive gull-wing outline is synony-

mous with carrier-borne conflicts in the Pacific theater. From its inception, this fighter was designed to be the fastest, most deadly aircraft ever to carry Navy colors. Dozens of action photos depict the pivotal role the F4U Corsair played and document its early trials, from its legendary exploits in the Black Sheep Squadron to its deployment in Korea.

Volume 7 takes you inside the B-17 Flying Fortress—the most famous, most respected bomber in aviation history. Factory assembly photos, technical drawings and battlefield action shots give the reader a look into the elegant design and ultimate functionality that made this plane a legend. For the modeler, 3-views, turret drawings and panel diagrams provide valuable information on details to give a scale project that finishing touch.

All three of these volumes are exceedingly well done from cover to cover. If you have a "thing" for warbirds, look for the Warbird Tech Series in your local bookstore. If you can't find it there, give Specialty Press a call at (800) 895-4585 or (651) 583-3239 and order the books directly.

—Matt Boyd

## HANGAR 9 Fieldmate Get Organized!

Ever gotten to the flying field and needed a spare glow plug or a screwdriver? I know I have. There's nothing like a well-organized and well-stocked field box to make your day at the field more enjoyable. The Hangar 9 Fieldmate is made of solid wood, and the attractive multicolored finish is fuelproof. Assembly consists of nothing more than attaching the rubber feet and a pull knob for the drawer. There's plenty of storage room: the spacious top compartment includes a rack for a glow driver and screwdrivers, and the roomy lower drawer holds those larger items that always seem to be in the way.

The Fieldmate comes with a heavy-duty rubber strap that securely holds your fuel jug. At the other end of the box is a large compartment for a gel-cell battery; it is covered by a precut power panel mount. I really like the way the panel mount swings up to allow access for battery recharging. The Fieldmate is a great field companion, and the \$39.95 price is great, too.

—Rick Bell



**Hangar 9;** distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 355-9511; [www.horizonhobby.com](http://www.horizonhobby.com). ⬆



# Film Covering Basics

*Colorful finishes made easy*

by Rick Bell

For many reasons, heat-shrink plastic films are easily the most popular way to cover a model airplane. They're easy to apply and come in just about every color imaginable; they're odorless, non-toxic and almost completely fuel-proof. It's easy to achieve a great-looking model without a lot of effort; you only need to know the basics of surface preparation and how to plan ahead, and you need the proper tools. Top Flite MonoKote was one of the first plastic films on the market; I've used it for years with great results, and I used it for this article.

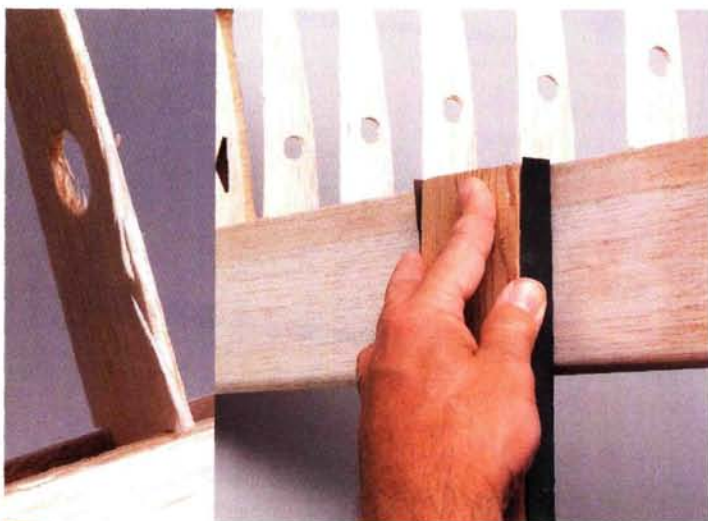


1

For this model, I chose a simple, two-color scheme and used a variety of tools: a sanding block with various grits of sandpaper and a new knife with fresh blades. Speaking of blades, always use a new one for any trimming; nothing is worse than having a dull blade snag and tear the covering. Other necessary tools are a heat gun, an iron, a trim iron, a metal straightedge, Coverite Balsarite, a tack cloth and covering material.

## REMOVING DENTS

Like most modelers, I managed to put a dent or two in the airframe; they had to be filled before I could cover them. Wetting dents with water and then heating them with a hot iron causes the wood fibers to swell, and this removes most small dents. When it's dry, sand the area smooth. I use lightweight balsa filler to fill larger dents. Most fillers dry very quickly (depending on how thickly you spread them) and can be sanded after 15 to 20 minutes. When the filler has dried, I sand the area smooth, feathering the filler into the surrounding area at the edges, and then I use a tack cloth to remove all traces of dust.



2

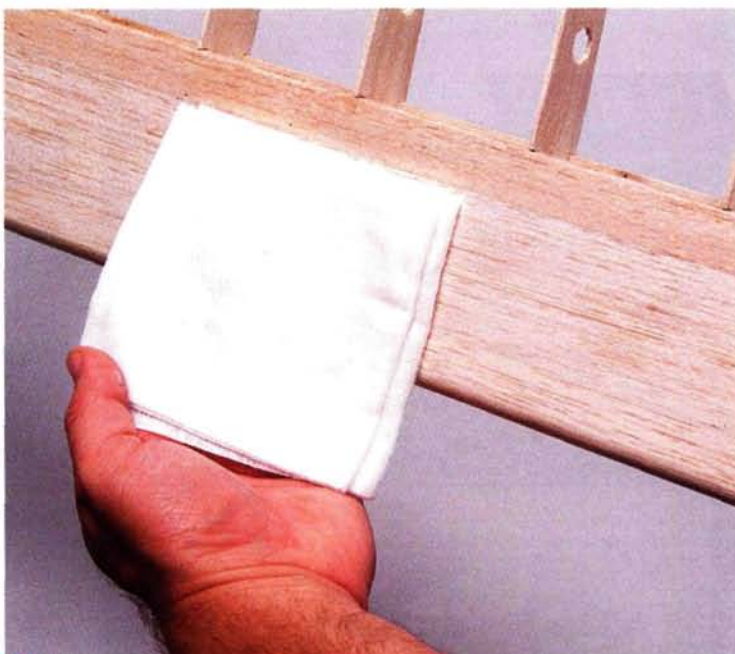
Before I even plug in the iron, I inspect all of the parts for any humps, bumps, dings and dents. They must all be removed because plastic film shows nearly every imperfection on the part being covered. Wherever possible, I use a sanding block. I start by sanding with 150-grit sandpaper and then progress to finer grits. I try to get the balsa as smooth as possible because the smoother the surface, the better the results.





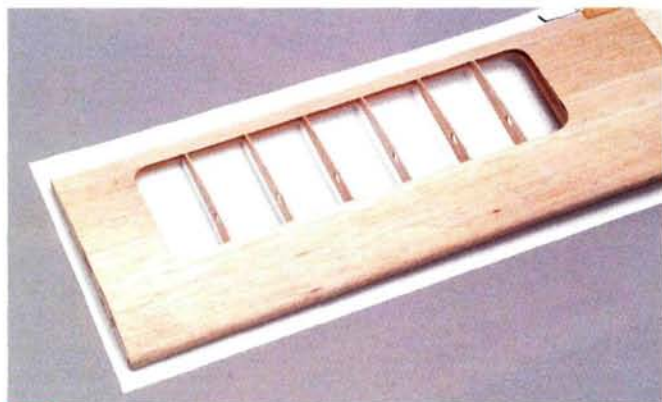
3

Before completing the final sanding, I apply a coat of Balsarite to help seal and toughen the wood. The Balsarite also raises more wood fibers and, in my opinion, it makes final sanding easier with better results. (This is just my preference; you can skip it if you want.) For final sanding, I use a sanding block with 400-grit paper and then progress to 600-grit. I sand the entire airframe; when finished, the airframe should feel like silk when you glide your fingers over it.



4

Don't skip this step; it's as important as the final sanding: vacuum all the airframe's nooks and crannies to remove all the dust and debris that always seem to collect. Now give the model a good rubdown with a tack cloth to remove any particles you missed. Remember: the better the finish underneath, the better the final result.



5

Before you start to cut the covering, you need to plan your trim scheme and determine the sequence for laying down the material. Just as when you paint, you should apply the lightest colors first. On this model, I decided to use two colors for the wing and fuselage. I began by covering the larger areas first and saved the scrap for smaller jobs.

I usually start with the bottom of the wing. Using a new blade, I cut the material slightly larger than the area to be covered. With a hot iron (follow the manufacturer's recommendations for heat), tack the material in the middle of the leading edge (LE) and then pull it taut and tack it to the trailing edge (TE). Now grab the material, pull it taut and tack it to the LE of the wing root. Do the same for the TE wing root and at the wingtip rib. Continue tacking and pulling out wrinkles on both the LE and TE until both have been completely sealed. I also completely seal both the root and tip ribs. The idea is to get the covering as tight as possible before shrinking it.



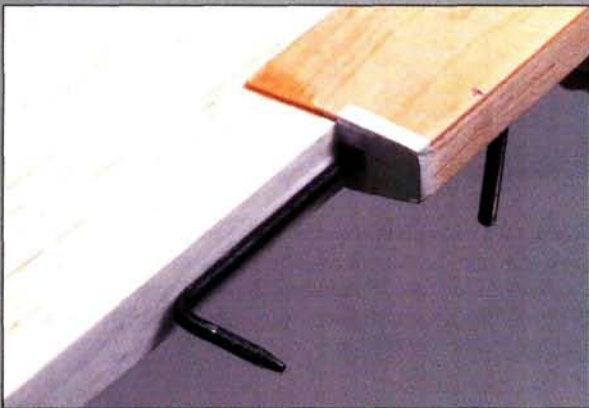
6

When using a heat gun, I usually wear a glove to avoid burning my fingers, as the temperatures can be quite high. I start shrinking the material in the middle of the panel and work toward each end. I also pull on the excess material on the LE and TE to prevent the seams from loosening and pulling in. Use caution with the heat gun; keep it moving, or you'll risk burning a hole in the material.



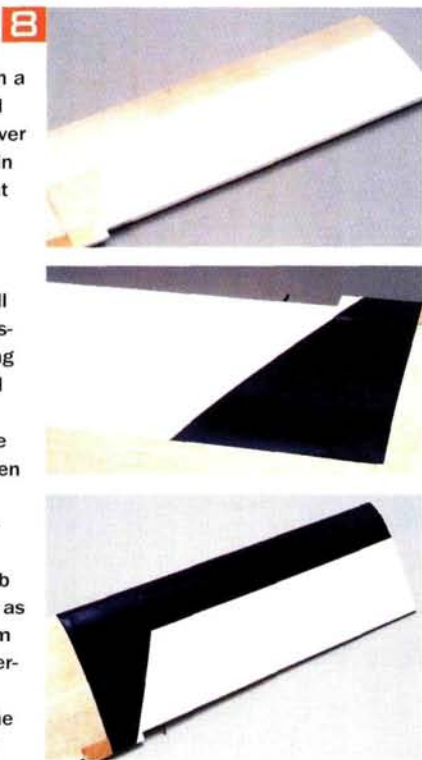
**TECH TIP****COVERING CUTOUTS**

On some areas (such as the aileron cutouts), it's advantageous to cover them first with small strips of material before you cover the wing. Because the torque rods are part of the structure, it's difficult to wrap the covering around them and achieve good results. Instead, cut a strip of covering, slide it under the torque rod and work the material into place with a trim iron. Also wrap about  $\frac{1}{4}$  inch of covering onto the top and bottom of the wing. When you cover the top and bottom, it will provide a lip for the covering and make an almost invisible seam. I also cover the ends of the ailerons, elevators and rudder this way.

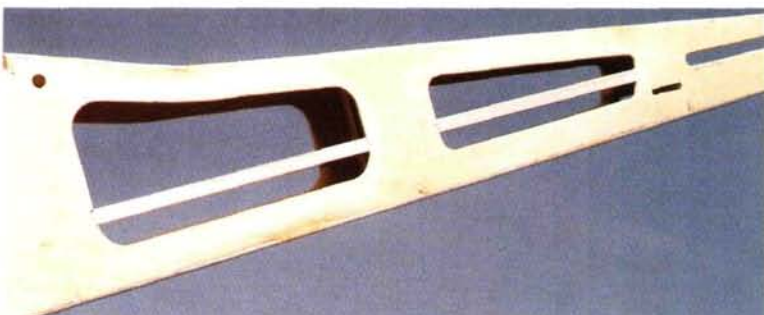


The two-color scheme on top of the wing is easy to do with a little planning. Instead of trying to iron film over film, I cover the wing in multiple pieces so that the covering has a wooden surface—not film—under it. This reduces waste and will help you avoid the frustration caused by trying to eliminate bubbles. I usually draw the trim scheme directly on the wing, measure and then cut the covering with about  $\frac{1}{4}$  inch for overlap. First, apply the main piece over the rib bays in the same way as you applied the bottom covering; the only difference is that the front and the root side of the covering have already been trimmed to size.

The blue trim is in two pieces and is also pretrimmed to size. Next, add the inboard piece followed by the longer LE piece. Notice the sequence for applying the covering; the lightest color first followed by the inner piece and then the LE. This places the seams downwind and prevents them from lifting.

**7**

After the shrinking has been completed, it's time to trim away the excess material. Be sure to use a fresh blade for trimming. For best results, I pull the excess material taut and smoothly glide the blade along the edge in one motion. For long, straight cuts, I use the metal straightedge; be certain not to cut into the wood below and possibly weaken it. Above left: here's the completed bottom panel, tight and trimmed.

**9**

For the fuselage, I added strips of balsa in the open bays where the different colors will match up. This gives the seams support and adds hardly any weight. I covered the bottom of the fuselage first, then the sides and finally the top using the heat gun to shrink the covering. The tail feathers are covered in the same way as the wing.

Covering an airplane is a lot of fun, and you can amaze other fliers with your new abilities. One of the biggest benefits is that you can personalize your model to really make it stand out. ✈

*Balsarite (by Coverite); Coverite and Top Flite; distributed by Great Planes Model Distributors Co., P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; fax (217) 398-0008; [www.greatplanes.com](http://www.greatplanes.com).*



# Stringers, formers and pull/pull systems

In my December 2001 column, I described how to about properly splice wooden spars and longerons and how to use gusset plates to reinforce glue joints. Staying in the wooden-structure mindset, let's look at stringers and formers.

Unlike spars and longerons, which bear structural loads, stringers only support an aircraft's outer covering. They improve an airplane's looks and aerodynamic sleekness. They contribute very little to its structural strength so we should make them as light as possible while keeping them stiff enough to adequately support the covering. Stringers should be about 3 or 4 times as deep as they are thick. For a 1/3-scale model, I like to use 3/32x1/2-inch stringers. Also, for additional rigidity in fairly large models, you can use spruce instead of balsa.

Stringers are usually very long and are exposed to knocks and bumps; they should therefore be properly supported. You can use either balsa sheet or lite-ply formers for support, but fitting them so that the stringers are straight and parallel to one another can be a challenge.

## SCALLOPED FORMERS

For a cleaner appearance, make sure that the formers don't touch the covering material anywhere. Only the stringers should touch the cloth. To accomplish this, cut away (scallop) the formers between the stringers.



I use spruce stringers in large models such as this 1/3-scale Pietenpol. Notice that they are fairly deep in comparison with their width. The depth of the stringers gives them their strength.



Left: to clean up a model's appearance, remove material from the formers where they touch the covering. Here, you can clearly see the scalloped edge of the former. Right: at the tail, where the formers are smaller, the stringers have to be tapered to maintain the model's outer profile. Here you see the last former just in front of the horizontal stabilizer.

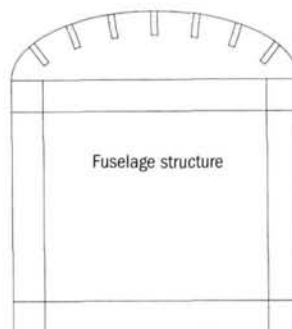


Models such as this Zivoli PT-17 Stearman use stringers to give the fuselage its rounded shape. Keeping those stringers straight and parallel can be a challenge.

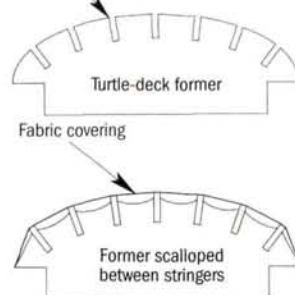
over the formers to strengthen the joint.

As the stringers reach the aft portion of the fuselage, their spacing will begin to get tighter and tighter. To prevent them from interfering with one another and with the underlying structures, you may have to taper their ends. Simply cut their undersides at an angle, but leave enough of each stringer to maintain the model's outer profile. A little cutting and whittling comes in handy when you have to make the stringers fit properly at the airplane's tail. Also, to prevent the fuselage from being bowed or warped out of shape, to balance the stresses, add the stringers a few at a time and then add a few on the opposite side of the fuselage. Once you've installed all the stringers, you'll be surprised how sturdy the fuselage will be.

## Typical turtle-deck former

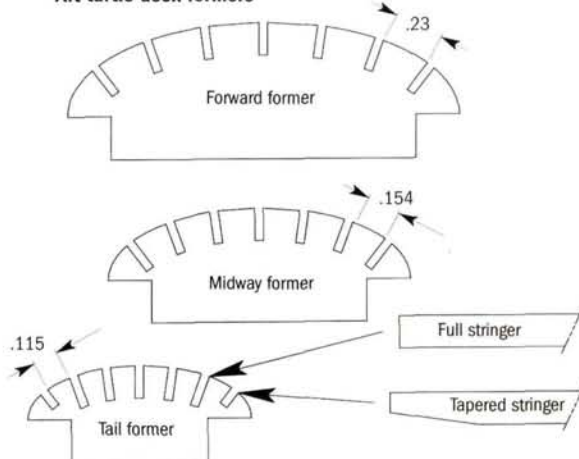


## Notches for stringers



Cutting scallops in the formers between the stringers prevents the formers from touching the covering and improves the model's looks.

## Aft turtle-deck formers



As the formers get shorter toward the tail, the notches for the stringers remain the same size, but they're closer together. Some stringers are tapered to fit so they don't interfere with underlying structures. (Dimensions are in inches.)



## PULL/PULL CABLES

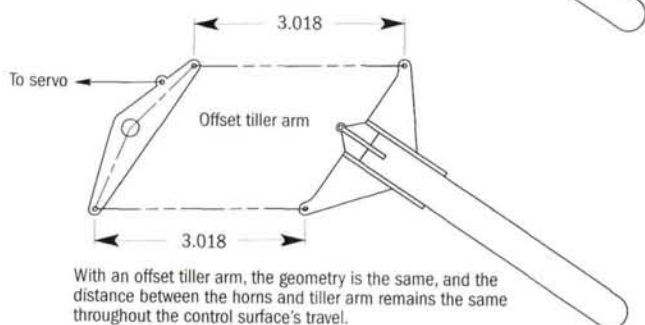
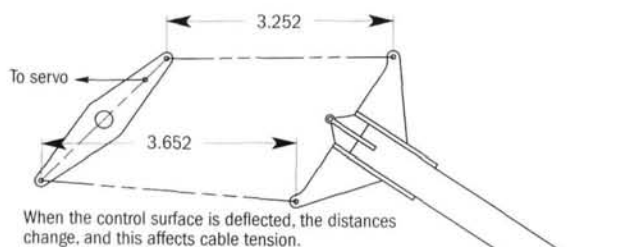
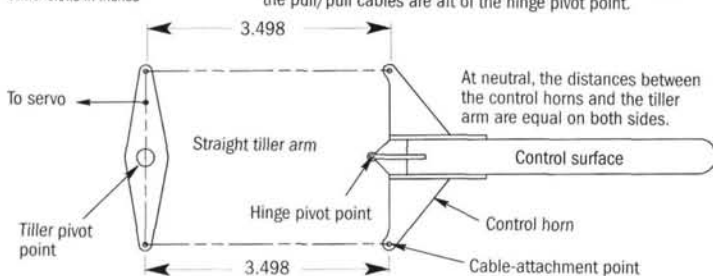
A great way to save weight in the tail of an aircraft is to replace those heavy pushrods with pull/pull cables. This is frequently done for rudder control and is often done for all tail-control surfaces in scale WW I and early vintage airplanes. If it's to operate properly, the geometry of the cable control system must be balanced to ensure and provide equal travel in both directions. As in full-size aircraft, a model's pull/pull cable setup is a closed circuit and to maintain proper control,



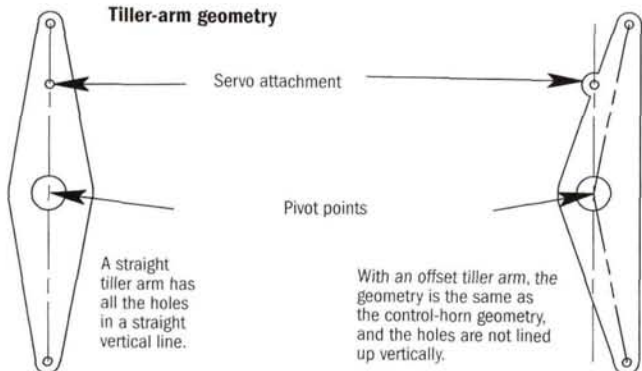
**This straight tiller arm is from Nelson Hobby Specialties. Notice its double-arm design; it is extremely well built and has ball bearings at its pivot point for friction-free operation.**

### Pull/pull control geometry

Dimensions in inches



### Tiller-arm geometry



the entire system must remain taut. The cables will slacken if the servo-arm or tiller arm and the control-horn throws are not equal. When a control surface is deflected away from neutral, one side of the cable feeds more than the other side pulls and this can lead to unwanted flutter; by equalizing tension on both sides of the cable control system, you keep the control-surface movement very stiff.

One way to keep the tension equal is to keep the control-horn attachment points for the cables directly in line with the hinge centerline. If this is not possible,

such as is often the case with a scale model aircraft, you can maintain the tension by making the tiller's arm geometry the same as the control horn's layout. If the hinge line at the control horn is  $\frac{1}{4}$  inch in front of the horn attachment points, make sure the tiller-arm pivot point is also  $\frac{1}{4}$ -inch in front of the cable attachments. Either way, it is the geometry of the two connected control input arms that makes the difference (see illustrations).

## CABLE ATTACHMENT

Another very important part of a pull/pull cable control system is how the cables are attached. For common, sport-flying models, you can simply hook the cables directly to the servo arm and let the servo act as the tiller arm. This works OK if you don't overtighten the cable tension. Too much tension will quickly wear the servo's output shaft and increase the servo's current drain. For large-scale models and for powerful aerobatic aircraft, it is best to install a separate tiller arm and drive the tiller with a short, stiff pushrod from the servo. In this setup you can also use two or more servos to drive the same control surface.

It is also important to have some way to adjust the cable tension between the control horns and the tiller arms. A simple way is to use a clevis and a threaded rod that has a hole drilled in it to accept the cable connection. For scale models, turnbuckles are preferred for a couple of reasons: it looks real, and you don't have to remove the cable from the control horn to adjust the tension.

It's important not to attach cables directly to metal control horns and tiller arms. You should use some sort of bushing material to isolate the attachment-cable loop from the metal control-horn's surface to prevent the metal from chafing and even cutting through the cable. For smaller models (1.20-powered and smaller), I use 0.018- to 0.020-inch stranded-steel cable (U-control leader); I simply loop it through the servo arm and swage a crimp tube onto the cable to secure it. For larger models, I use 0.032 Berkley nylon-coated



**Nelson Hobby Specialties offers several types of pull/pull control hardware. Here are the 4-40 ball-link clevis and cable end attachment hardware.**



**For large models I use Berkley nylon-coated steel fishing leader cable. It is available in large quantities and costs less than \$25 for 300 feet. The turnbuckles I use are from Du-Bro as are the new molded clevises that feature a sliding lock and a metal pin.**



steel fishing leader and metal clevises for all the attachment points. Berkley fishing leader is available at most deep-sea-fishing shops and can also be found on the Web. Short lengths of brass or copper tubes can be used to secure the cable loop ends, and they require a couple of crimps (using an electric crimping tool) to secure them. Don't use a flat pair of pliers, as it will flatten the tubes and can cause them to crack. I like to use a 3/8-inch-long tube with an inside diameter that's twice that of the cable I am crimping (1/16-inch-i.d. for a 1/32-inch cable). I then crimp it in the center of the tube and again on either side of the first crimp. You can add a few drops of thin CA to the tube if you like, but so far, I have not found this to be necessary.

Using pull/pull control cables greatly increases your model's

control response and, at the same time, reduces unwanted tail weight. If you haven't tried it yet, now is as good a time as any to fly by cable; give it a shot.

#### NEW FUJI GASOLINE ENGINES

I just wanted to add this photo of the new Fuji 50A S distributed by Tower Hobbies. This 46.5cc 2-stroke gas engine has an overall length of 8.5 inches, is 5.5 inches wide and 7.5 inches high (including spark plug and wire). It features a one-piece, solid-state-capacitor discharge ignition and a user-friendly Walbro pumper carburetor with choke plate. It has a machined-aluminum single-bolt propeller hub that is available in three other lengths for cowls of different sizes.

The large canister muffler has a large exhaust outlet and comes with a metal gasket and mounting screws. The separate engine head is painted light blue, and the two-piece crankcase is natural aluminum. Also included are a Champion RCJ6Y spark plug, two flat-plate aluminum engine mounts (already attached to the case), a spark-plug tool and



The new Fuji 50 SA gasoline engine looks attractive. The 46.5cc engine produces more than 5hp at 10,000rpm.

throttle-linkage hardware. Horsepower is said to be 5.2 at 10,000rpm.

Fuji recommends a 40:1 gas/oil mix (3.25 ounces of oil per gallon of gas) and a break-in mix of 25:1 for the first hour of running. Keep an eye out for an engine test in a future issue.

#### MANUFACTURER'S PROP RPM FIGURES

APC	Bolly carbon props
18x10—8,200 to 8,500	20x10—7,600 to 7,700
18x12—7,500 to 7,800	21x10—7,100 to 7,200
20x8—8,100 to 8,400	
20x10—7,100 to 7,300	

Well, that's it for another month. If you have any big bird questions or comments, please write to me c/o *Model Airplane News*, 100 East Ridge, Ridgefield, CT 06877-0646 USA, or email Gerry@airage.com. ✦

**APC Props;** distributed by Landing Products, 1222 Harter Ave., Woodland, CA 95776; (530) 661-0399; fax (530) 666-6661; [www.apcprop.com](http://www.apcprop.com).

**Du-Bro Products,** P.O. Box 815, Wauconda, IL 60084; (800) 848-9411; fax (847) 526-1604; [www.dubro.com](http://www.dubro.com).

**Nelson Hobby Specialties,** 394 S.W. 211th Ave., Aloha, OR 97006; toll-free (877) 263-5766; (503) 259-8899; [www.nelsonhobby.com](http://www.nelsonhobby.com).

**Tower Hobbies,** P.O. Box 9078, Champaign, IL 61826-9078; (800) 637-4989; fax (800) 637-7303; [www.towerhobbies.com](http://www.towerhobbies.com).



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*Adding details that  
bring a model to life*

# Stits Lite painting and finishing

by Bob  
Benjamin

Last month, I showed how to apply a heat-shrinkable fabric finish to a model using the Stits Lite products from F&M Enterprises. This article picks up where we left off and shows how to add the final surface details and achieve a beautiful painted finish. Let's get started.



*My painted and nicely finished Dynaflight Fly Baby in classic U.S. Army trainer colors.*

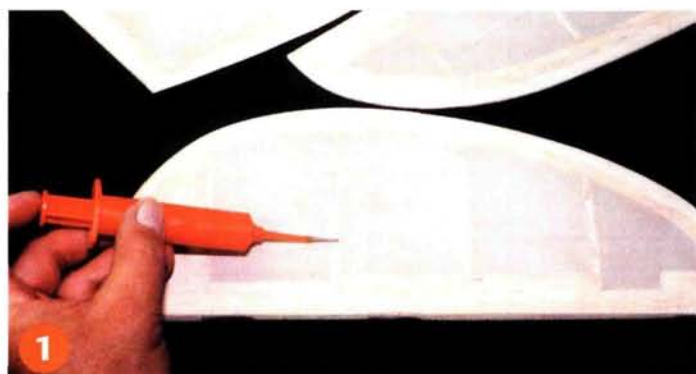
## RIB STITCHING

It isn't absolutely necessary to simulate rib stitching, but many modelers enjoy including this detail on their fabric-covered scale models; of course, it's a must-do for scale contest work. I use a custom-made "stitch-shooter" that I assembled with an old syringe and a small-diameter metal tube from the hobby shop. I form the stitches with beads of Tacky Glue, which is available at most craft stores.

Every full-scale fabric-covered airplane is subject to FAA regulations that dictate how far apart the rib stitches on their flying surfaces must be spaced; you will have to research this information to find out what the correct spacing is for your model. On my Fly Baby, the full-size interval is 3 inches between stitches, which converts to  $\frac{3}{4}$  inch at  $\frac{1}{4}$  scale. After I've applied the first coat of Poly Brush and it has dried, I draw pencil lines spanwise on the wing. I place a stitch at each line and rib intersection. With a little practice, you can apply all of the stitches to the wing in short order. Try to make them all the same width.

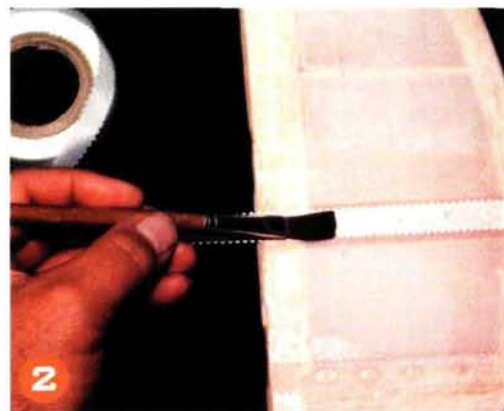
## PINKED TAPES

On full-scale aircraft, these pinked tapes (often called rib tapes) seal and protect the exposed portion of the rib-stitching cord; they have pinked edges to increase the gluing surface and to strengthen the glue bond. F&M Enterprises provides pinked-edge tapes made from the same Poly Fiber as the covering cloth is made of; the tapes are available in a variety of scale widths. Just as with the full-scale aircraft, the pinked tape on our models is attached to the wing with Poly Brush. Each tape wraps all the way around the flying surface, even if there is a sheeted leading edge and trailing edge (LE and TE) that is not stitched. This way, there is never an unprotected end to work loose and tear away in the slipstream.



After all the covering has been attached, tightly shrunk and sealed with a coat of Poly Brush, you can add the surface details—rib stitching and pinked tapes. Here, I am applying a bead of Tacky Glue with a disposable plastic syringe.

Once the "stitches" have dried, cover them with a strip of Stits pinked tape. Use Poly Brush to stick the tape into place. Apply enough Poly Brush to completely saturate the weave of the tape.



Here, you can see the pencil lines I drew on the wing's covering to help keep the rib stitches in alignment with one another and to keep them spaced properly.

Once the tapes have dried, any bumps, lifted edges, or bubbles can be smoothed out with a covering iron.





## EDGE TAPES

Applying these is the final step in the full-scale covering process; they seal all the exposed fabric overlaps and seams as well as the ends of the pinked rib tapes. All of the fuselage stringers and longerons should be taped over where they contact the fabric. Modelers who do not want to bother with rib-stitch detail may still want to use edge tapes for a finished appearance, as well as for the extra mechanical reinforcement they add. Edge tapes are characteristically wider than the rib tapes; on my 1/4-scale model, they are 1/2 inch wide, and the edge tapes are 1 inch wide.

Edge tapes are applied to the TE first so that as you work your way around the wingtip and the LE, any overlapped seams in the

sprayed with a coat of Poly Spray. On full-size aircraft, this aluminum-pigmented material both protects the underlying fabric from damaging ultraviolet rays and provides a uniform undercoat for the final painted finish. Poly Spray can be wet-sanded to a fine surface finish, or it can be left as is. Wet-sanding is messy but very necessary if you want to do a great finishing job with any fabric-and-paint method. Use 400-grit sandpaper and plenty of water, and just dive in and do it. Then clean up and enjoy the results.

This is the time to add all the fine detail. Windshields can be added and masked off, and hatches and metal sheeting edges can be masked off and created with filler. After the underlying surfaces have been finished and sanded smooth, a coat of Poly Spray will show where you need to sand down any high spots on the fabric.

## PAINTING

An entire article could be devoted to spray equipment. I use a DeVilbiss automotive touchup gun and a smaller Paasche airbrush for my finish paint work. Stits Poly Tone paint can be used with any good-quality spray equipment; it's the easiest paint to work with that I have ever used. It can be used with glow fuels that contain up to 15 percent nitromethane. Light colors should go on first; apply a



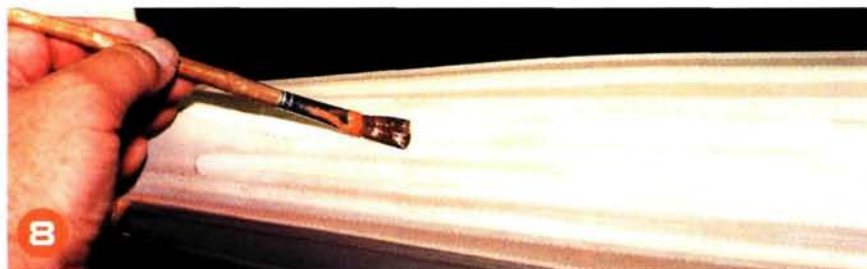
**To help the edge tapes lie flat around sharp bends and corners, heat them with a covering iron, and slowly shrink them into place.**



**Once all the tapes are in place, apply another coat of Poly Brush over the tapes and flow it on. Fill the weave.**



**A little finger pressure will help corner edging tapes stay put until the Poly Brush dries.**



**Do the same for tapes over stringers; flow the Poly Brush on, and let it dry.**

tapes will face the rear. This gives them a neat appearance and makes the seams aerodynamically cleaner. To apply the tape, use Poly Brush and finger pressure to seal it into place. A top coat of Poly Brush seals the tapes after they have been attached. A final overall coat of Poly Brush should then be added after all of the tapes have been attached and sealed into place. Any last-minute touchups of unwanted raised edges or rough spots can be done with the heating iron set at a low temperature (about 225 degrees). This little extra effort makes a big difference in the final appearance of the finished paint job and is actually much easier than trying to sand down the odd bumps later on.

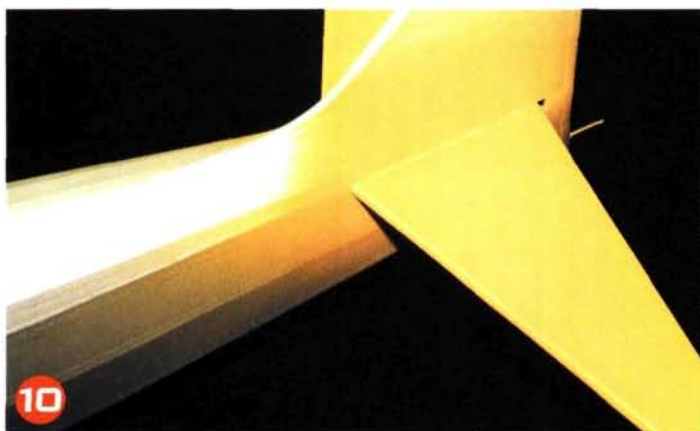
## SURFACE PREPARATION

When all of the fabric and tape work is in place and has been sealed with at least two coats of Poly Brush, the entire structure is then

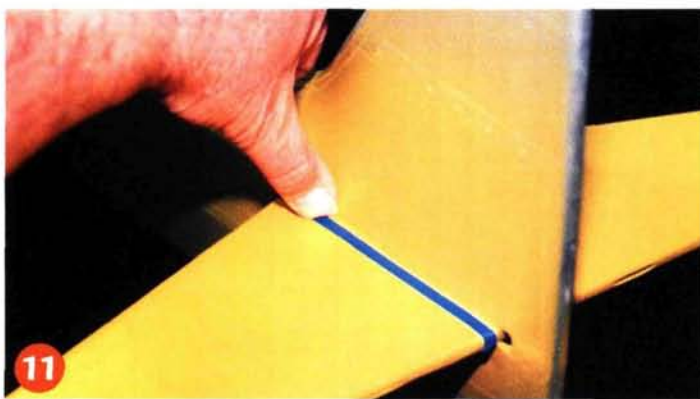


**After the Poly Brush has dried, spray on a coat of Poly Spray. This aluminum-pigmented filler coat can be wet-sanded with 400-grit sandpaper for a very smooth finish.**

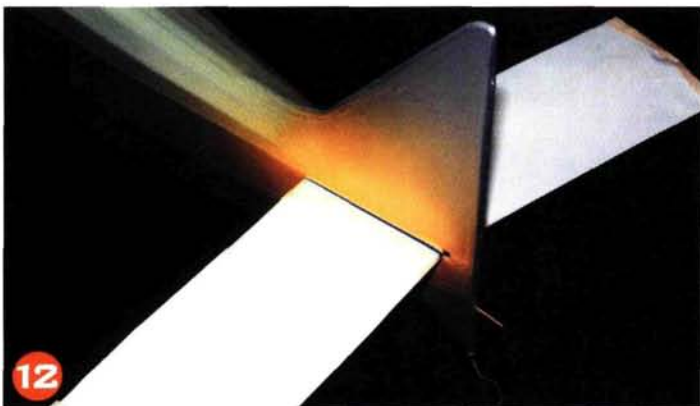




**10**  
When painting, apply the lighter colors before the darker ones. Here, I am applying the Trainer Yellow to the horizontal stabilizer.



**11**  
I use 3M Fine Line masking tape to establish the demarcation line between colors. Use your thumbnail to seal the tape tightly into place.



**12**  
Mask the rest of the stabilizer with brown wrapping paper and hold it in place around the edges with paper masking tape.

mist coat first to provide some surface adhesion, and then apply a solid-flow coat followed quickly by another coat as soon as the previous one begins to dry.

To mask between colors, I define the demarcation line with a strip of 3M Fine Line masking tape. Use your thumbnail to press the tape down and tightly seal the edge. This prevents paint from bleeding underneath the edge. Use ordinary brown paper to mask off areas you don't want painted with the next color, and use masking tape to secure the paper to the 3M tape. Don't use newspaper for this job; the ink will smudge onto your nice, new paint job.

The rudder on my airplane has a three-color paint job. The white base color is sprayed on first, followed by the dark blue leading edge. The classic pre-WW II red stripes are carefully measured (there



**13**  
I use an automotive touchup gun to spray the Poly Tone paint, but you can use any high-quality painting equipment.



**14**  
The finished tail of the Fly Baby looks great. I just love those classic red stripes on the rudder.



**15**  
A little detailing here and there, and the Fly Baby is ready to go. Stits Lite is great to work with and easy to repair; give it a try.

are always seven red and six white), and the white areas are masked off. Spray on the red, remove the tape, and you've finished.

Was it worth the trouble? The satiny sheen of real aircraft paint on fabric, the classic U.S. Army blue and yellow trainer paint job and that bright red-striped tail are just too much to resist. Using the Stits Lite process results in a durable finish that will still look this way years from now. Small dents and scratches are easy to repair, and the stability of the fabric and paint means that it won't bubble, sag, or creep. ✈

F&M Enterprises, 22522 Auburn Dr., El Torro, CA 92630; phone and fax (714) 583-1455; [www.stits.com](http://www.stits.com).  
Paasche Airbrush Co., 7440 W. Lawrence Ave., Hancock Heights, IL 60656-3497; (708) 867-9191; fax (708) 867-9198; [www.paascheairbrush.com](http://www.paascheairbrush.com).



# You got questions? I got answers ...

*This month, I again devote my space to answering your questions—about engines, of course!*

## OLD AND “FROZEN”

Can you can help me or direct me to someone who will be able to answer my questions? I have some old collectors' vintage model engines, and one I received recently has seized—frozen tight. Is there any way to un-stick such an old engine? I soaked it in Mystery Oil for two weeks; I boiled it to try to force changes in metal-part dimensions that might break it loose. No luck. Tonight, I plan to stick it outside in very cold weather [Alaska] to cause the contraction of parts; that might break it loose.

I'm sure it seized because its previous owner didn't clean it



after its last run. Ordinarily, I would just buy a new engine, but these old engines are not easy to get. Any tips will be very much appreciated.

My other questions are also about very old collector engines. When a gasket has to be replaced, where can I find gasket material, and what's the best way to cut a gasket to size from bulk material? Again, since these old engines are no longer manufactured, the parts are not available in any hobby stores. [email] CLYDE E. PEARCE

*Clyde, let me first answer your gasket question: if you can't find a fitted gasket, I've had very good luck forming my own gaskets for old, out-of-production engines using high-temp silicone sealant. It has really done the trick for me.*

*As for your frozen engine, you don't say what the piston and sleeve*

*are made of, and of course, this does make a big difference. If they are both made of ferrous metals, they may have fused together because of acute, prolonged corrosion. Let's hope this isn't the case, as this situation is irreversible. I doubt that further freezing your "frozen" engine will do anything, but who knows? Perhaps an Alaskan night will crystallize solidified varnish into powder! Nah; probably not. Seriously, for a question about a vintage engine, I always defer to my mentors, Dave Gierke, Clarence Lee and Mike Billinton. Their years of experience make them far more qualified than I am in this case. Accordingly, I turn things over to my good friend "Dyno Dave" Gierke, who offers a step-by-step method that might work for you.*

*Good luck. —Chris*

*Hi, Clyde. There are two possible reasons for your antique engine's freezing:*

- 1. The piston has rusted to the cylinder—if the combination is made of iron and/or steel (you don't mention the manufacturer or size).*
- 2. The more likely cause is a gummed-up piston and cylinder; over the years, the varnish build-up has solidified. To free a gummed-up engine:*

- Fasten a propeller to the crankshaft.*
- Using a butane torch, heat the cylinder and head; carefully heat the fins evenly until the oil begins to smoke, and then stop.*
- While holding the engine with an old pair of oven mitts, gently try to turn the propeller. If it doesn't turn over, apply more heat and try again.*
- When the prop breaks free, carefully disassemble the engine and clean it with an engine cleaner such as Demon Clean that is specifically formulated for removing varnish.*

*If nothing budes after all this, the engine has probably rusted, in which case your only hope is to soak it in a penetrating oil over a few days and try again.*

*Depending on your engine's make and model number, gaskets may still be available! For further information, I suggest that you contact the Model Engine Collectors Association (MECA), P.O. Box 5, Sierra Madre, CA 91025.*

*—Dave Gierke*

## WHICH PLUG EQUALS WHICH?

I've been desperately seeking information on glow plugs and how a specific plug from one manufacturer compares with another. I posted this question on several online bulletin boards with no success. No one has come up with a source of information for me, but a couple of guys wrote that they are as confused as I am. I've noticed that this subject has come up recently in a few letters you have answered, and you, Chris, are my last hope. Can you help? [email]

MARIO FALCONE



Sorry, Mario. No one could come up with a cross-reference source of information on glow plugs from various manufacturers because none exists. The bigger problem is that there's no standardized glow-plug rating, and comparing manufacturer ratings is totally arbitrary. Simply put, when measured in the real world, brand X's "cold"-rated plug may turn out to equal brand Y's "medium"-rated plug. Coming up with a standard for all the plugs available from all the manufacturers out there would be a laborious and monumental science project that, so far, no one has taken on. Contrary to what some might tell you, all plugs are not created equal, and having the right plug will give you better, more dependable engine operation. The best example of this is still that the O.S. "F" plug will provide the best performance for all 4-stroke engines, regardless of manufacturer. I can, however, offer this: as is the case with fuel selection, going with the engine manufacturer's recommendation is the best place to start. This doesn't always apply; in the case of a 4-stroke, see what the experienced guys at your local field use. And remember: even if a plug glows when powered up by a battery, it isn't necessarily operating optimally. This is especially true if the plug is of a dubious age. When in doubt, replace the plug with a new one.

—Chris

### SURGING MAGNUM

I recently purchased my first 4-stroke engine—a Magnum .52. I followed the engine's break-in instructions exactly, but at full power, it surges, and if I make any attempt to adjust the needle valve in either direction, the engine instantly quits. It has had two to three hours of run time, and I use Byron 15-percent-nitro/16-percent synthetic/castor-blend fuel and a Fox 4-cycle glow plug. Please let me know what might be causing the problem. [email]

KEVIN

OK, Kevin; first, put an O.S. "F" plug in the engine. Second, check the fuel-delivery plumbing for pinhole-size air leaks. Third, bring the engine up onto compression manually. After three to four hours of break-in, the engine should hold a good compression seal. If it doesn't, it won't have proper fuel draw and will run erratically. There are several possible causes of poor compression in a new engine: one

of the valve clearances might have been set too tight, so the valve doesn't rest completely on the valve seat. In a few Magnum engines, it took a very long time for the piston ring to fully seat on the cylinder sleeve. Check that the valve clearances are set according to the instructions (cold), and run the engine for another hour or so. If this doesn't help, it's time to send the engine back to Global for servicing.

—Chris

### TIME TO REPLACE THE PLUG?

Last summer, I purchased an ARF Hirobo Shuttle helicopter with an Enya .35 engine, and I greatly enjoyed learning to fly it. I use PowerMaster fuel; the first gallon was 15-percent-nitro RC aircraft fuel; the second and third gallons were 20 percent nitro, and the last two gallons were 25 percent nitro. The engine has a very smooth idle that is slow enough to disengage the clutch. The top-end power seems very good for hovering and flying circuits. I still use the original glow plug. In your opinion, how often should I change the glow plug and how long can I expect the engine to last? [email]

JIM HEBERT

Jim, it's hard to say how long a plug will last; plugs in sport 2-stroke and 4-stroke engines can last a very long time. Plugs in ducted-fan use have far shorter lives; helis fall somewhere in between, but closer to sport use. Being run often in hot, humid weather can shorten the life of a plug—and of an engine, especially if you tune it for all-out max power all the time instead of going for a slightly richer mixture.

Because helis are more sensitive to engine misfiring, which can cause drive-train vibration, the RC heli community considers plug replacement smart preventive maintenance, and I suggest you adopt the same view. Don't skimp on a fresh plug supply; the costs of replacing bent heli parts that result from an engine flame-out and consequent crash can add up really quickly!

Enya engines have some of the best metallurgy in the industry and, again, if you tune for a slightly rich mixture that supplies more oil and more expelled unburned alcohol (both of which carry away heat and yield cooler running), you will have that engine for a very long time. And, of course, don't forget proper after-run care. —Chris ✦

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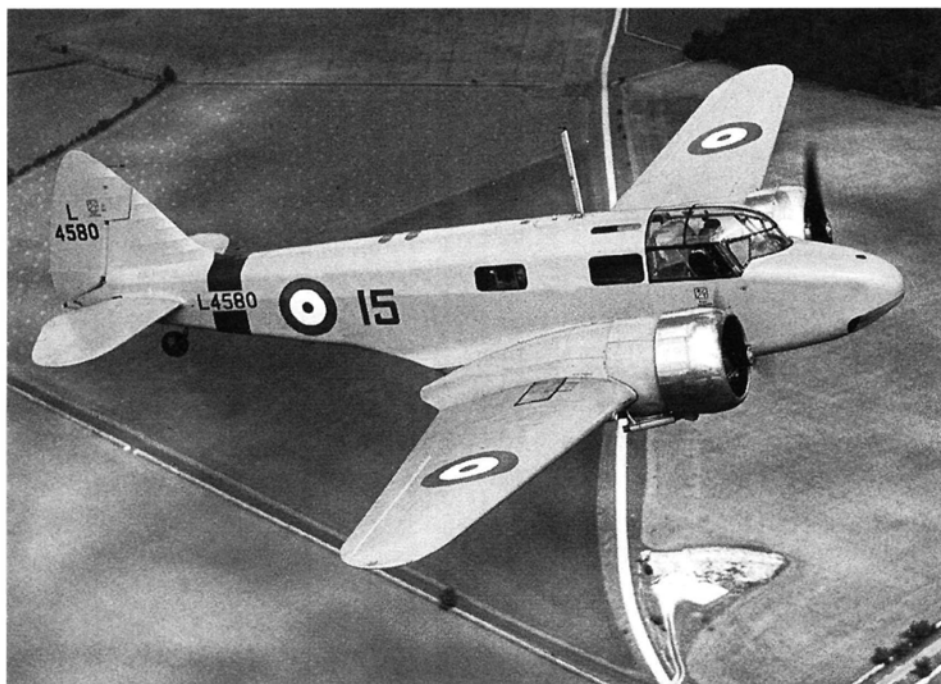
# MODEL Airplane NEWS



# NAME THAT PLANE

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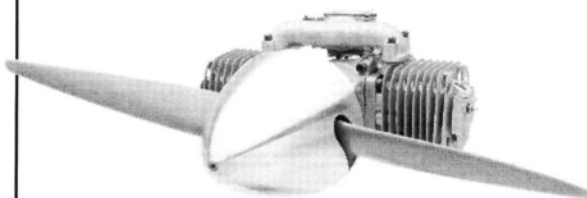
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Congratulations to Luis Leyton-Gonzalez of Brownsville, TX, for successfully recognizing the Hawker Tempest II as December's mystery plane.

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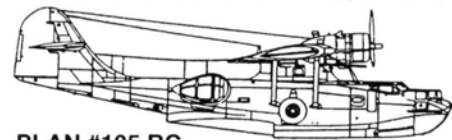
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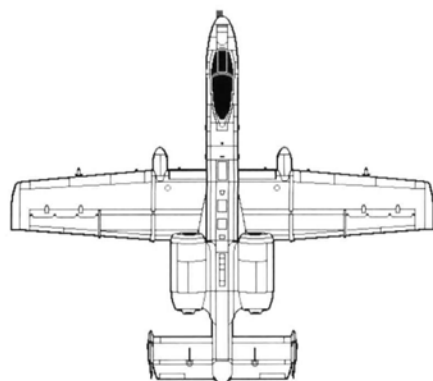
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# FINAL APPROACH

BY MATT BOYD

## Concept model— 40 years in the making

The DH-100 DBA making its first flight on August 21, 2001.



**C**reative solutions to difficult problems are the mark of a talented designer, and after one look at the airplane on this page, it's obvious that the man who designed it took a very creative approach to solving a very *big* problem. That man is Dee Howard, and his creation is the DH-100 DBA: an airplane that ended up as, in Dee's words, "A piece of history that *almost* happened."

Around 1965, NASA actively solicited proposals from several companies to design an aircraft that would be capable of transporting the Saturn II rocket booster—the center of the U.S. space program at the time—from California to its launch site in Florida. Until then, NASA had relied on ships to carry the 166-foot-long, 40-foot-diameter Saturn II to Florida via the Panama Canal. Sea transport was slow, but no airplane in existence then had the cargo capacity necessary to do the job. Several proposals were submitted, but the Dee Howard Co. was given the go-ahead to develop the DH-100 DBA.

The project eventually fell victim to bureaucratic infighting between government agencies, so a full-size DH-100 DBA was never built. Despite its ungainly appearance, however, wind-tunnel tests showed the design had potential. Like his airplane, Dee appeared as unlikely a candidate for success in aviation as he could be; he founded his company in 1947 despite having only a seventh-grade education. Dee knew that his DH-100 DBA (which stands, appropriately enough, for "Damn Big Airplane") concept was sound and that, if built, it would fly—and he was determined to prove it.

Dee sold his company in 1990, but he still had dreams of seeing the DH-100 DBA fly, so he contacted Tom Prescott and asked him to build a flying scale model of his plane. Because of the design's unique layout, the model is being developed in stages. The first

**Left: the DBA crew, from left to right, consists of Gordy Harris, Jim Agnew, Tom Prescott (pilot), Dee Howard, Betty Howard and James Higgs. Center: this is a desktop model of the original proposed design for the Howard DBA. The final scale version will more accurately reflect this model and is now in production at Prescott Products in Boerne, TX. Right: the DH-100, just before its first flight. The wings, gear and power system are scale; the scale fuselage is in production and will soon be added.**

stage was to build a model with scale wings and power system. This test mule is approximately 1:16 scale and uses balsa, foam, plywood and fiberglass in its construction. The original design called for a biplane configuration, with one wing above and one wing below the bulbous fuselage. The test mule shares this layout; its wingspan is approximately 12½ feet across at the top wing. The full-size plane was to be powered by 10 (!) wing-mounted, surplus DC-7 turbo-compound engines—six in the upper wing and four in the lower wing. The test mule retains the scale locations and substitutes 10 YS-53FZ 4-stroke glow engines, each with its own 12-ounce fuel tank.

The test mule had its maiden flight on August 21, 2001, with designer Tom Prescott on the sticks. The model incorporates ailerons and flaps on both wings, independent elevator servos, a gyro-equipped rudder and scale, 20-wheel landing gear. In total, the model uses 24 servos and has a maximum takeoff weight of 100 pounds. It carries enough fuel for 20-minute flights.

The next step in the model's development is underway—scale fuselage panels to give the test mule the look of the original. But even without them, this model has achieved its most important goal: to prove that Dee Howard's design is a success. We've no doubt that it will work just as well in final form. When it does, this "Damn Big Model" will serve as a flying tribute to creativity and determination. ✦